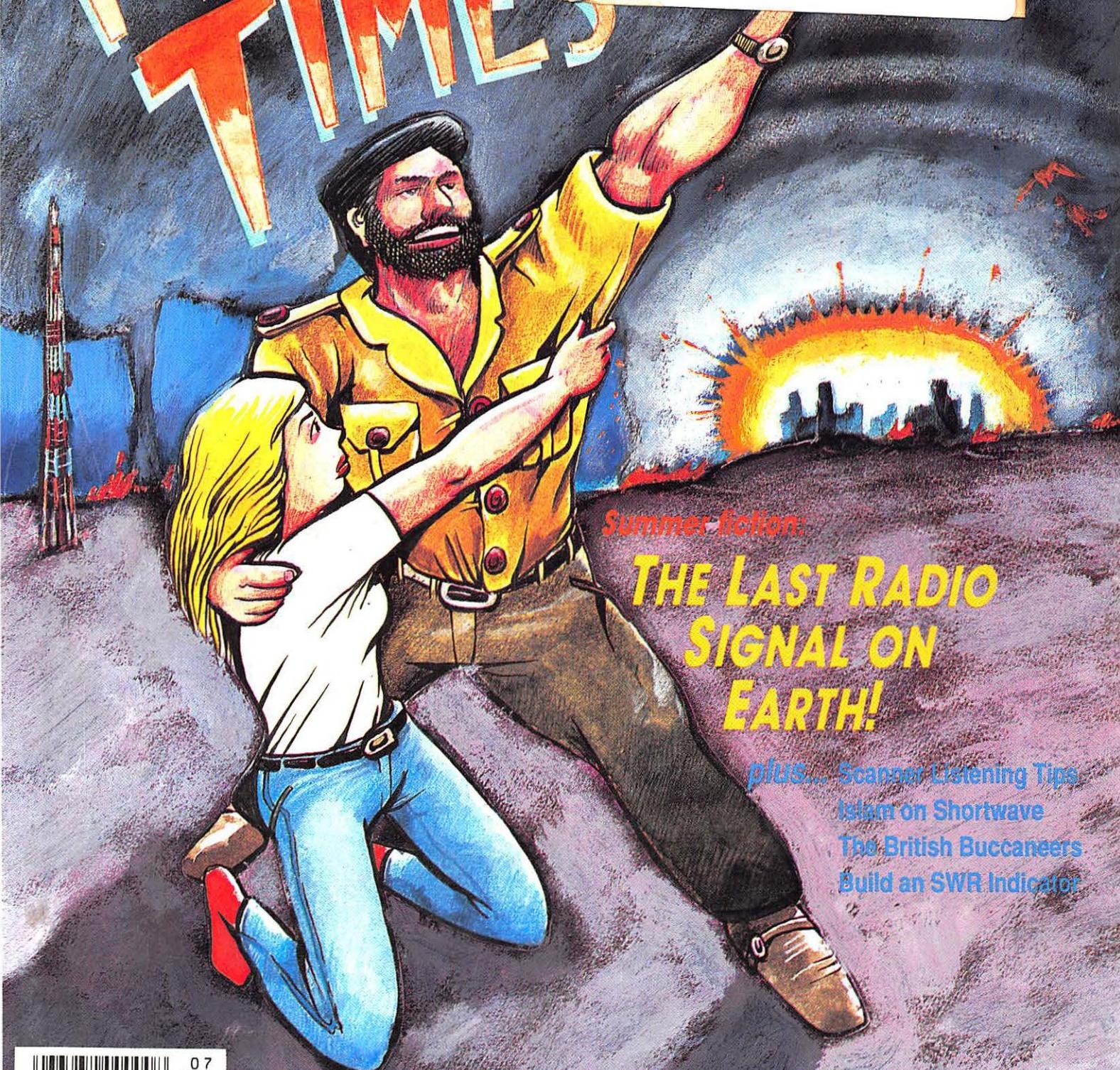


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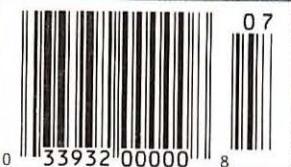
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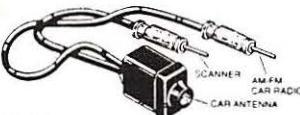
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July 1989 Volume 8 Number 7
A Publication of Grove Enterprises

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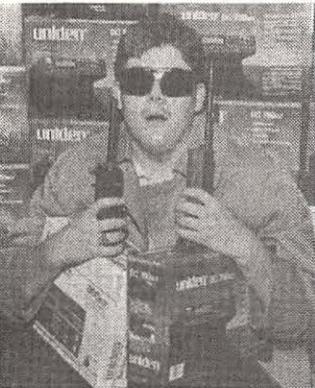
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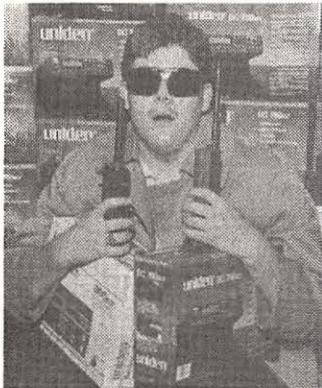
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MONITORING TIMES



Get even more out of your scanner listening - p. 6



Summer fiction ... it'll have you on the edge of your seat! - p.18

We cracked the piccolo ... and we're crowing! - p.47

Magne tests the Lowe HF-225 - p.86

Get 100 more channels from your ICOM R-7000 - p.94

20 Ways to Increase Your Scanner Enjoyment by Edward Hesse

Experience is the best teacher; next best is someone else's experience. Let Ed Hesse show you how to have more fun!

Islam on Shortwave by Jason Patterson

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This often puzzling religion is now a major force in world politics; are there any programs that can help us better understand it?

The British Buccaneers by John Santosuosso

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We call 'em pirates; in Europe they're often called Anoraks. Find out who they are and why they are named after a raincoat!

HF Holdup by Brian Rogers

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I'll never forget the night the cops brought me home.

The Last Radio Signal on Earth

18

by Wayne Mishler

Could yours be the last signal ever heard? Or you the last one to hear it? A prime piece of fiction to cool down a hot summer's day.

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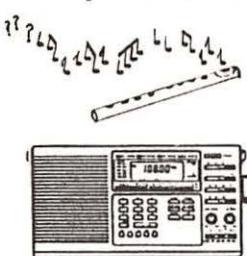
• "Service" is a word that comes up often in some parts of the radio hobby. But what about those of us who are not hams -- radio hobbyists who own shortwaves, scanners, other two-way or even AM-FM? Is there any real benefit to owning one of these radios other than recreation? We asked *Monitoring Times* contributor Wayne Mischler to dream up the worst scenario he could and fill it with a typical radio hobbyist. The result is some very special summertime reading: "The Last Radio Signal on Earth!"

• That's not all. As Iran continues to mourn the death of the Ayatollah, Islam continues to make front page news around the world. It's a religion that produces some very strange -- to Western eyes -- customs. But what is Islam all about? And how can you monitor this growing factor in world politics. "Islam on Shortwave" takes us on a spin through the shortwave dials to examine the stations and programs that broadcast shows on this religion.

• From another part of the world comes word of the free radio movement. These broadcasters are known by different names in different places. Here they're generally called pirates. In Europe, however, they're known as Anoraks. *Monitoring Times* columnist John Santosuoso visited Europe, listening to Anoraks, talking to them, and prepared this exclusive report.

• Summer is one of the hottest time of the year for scanner listeners. With all of the outdoor activity, there's so much to hear on the radio it's unbelievable. And even with all of that fun going on, Ed Hesse check in with an article that threatens to actually *increase* your scanner enjoyment -- so much so that Ed named the article, "20 Ways to Increase Your Scanner Enjoyment." Check it out.

• Spin about the radio dial and chances are you'll hear a lot of strange sounds.

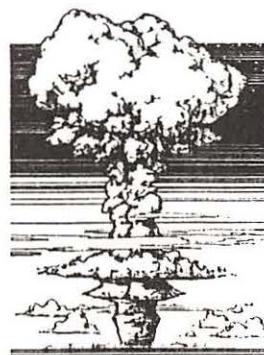


One that's long puzzled hobbyists is a type of RTTY called piccolo. Piccolo got its name because it sounds like someone playing random notes on a piccolo. The fact is, it's hard to believe that this is really carrying data. • Last month, for the first time, *Monitoring Times* RTTY columnist Jack Albert and his good friend Dave Wilson cracked the piccolo. Read the exciting story of how these two radio hobbyists managed to change musical notes into information.

• Jack Albert and company aren't the only *Monitoring Times* staffers hard at work during the summer months. Utility columnist Larry Van Horn has also had his nose to the grindstone for you. Van Horn, it seems, has solved another mystery and discovered a brand new Air Force weather network on shortwave. We've got it all. Dates, times, frequencies, modes and methods. • *Monitoring Times*, it seems, is getting a reputation for snooping out the radio news: When Van Horn finally did track down the network, the officer answering the phone said, "I was wondering when you people would be calling."

• There's much more in this issue of *Monitoring Times*, too. Clem small offers the first in a series of easy "you-build-it" antennas for radio listeners. Uncle Skip has a few tips on foiling interference and Doug DeMaw has plans for a simple, sensitive SWR indicator. • Finally, *Monitoring Times* is pleased to welcome two new columnists, Karl Zuk and Rich Arland. Karl, an engineer for ABC, will be taking over the American BandScan column from Larry Miller who moves to Consumer Electronics. And Rich Arland kicks off a revitalized Experimenter's Workshop. If you're into modifications or do-it-yourself projects -- scanner shortwave or ham -- Rich wants to hear from you.

• There is more, of course, but to give you all of the details here would probably spoil most of the fun. So take a few moments and run through the pages of this month's issue. We had a great time putting it together for you. We hope you have a great time reading it!



MONITORING TIMES

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Larry Van Horn

Below 500 kHz

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LETTERS



Natl Geo Soc

Guatemala, Atlee, and the CIA - setting the record straight

While Don Moore's article entitled "Revolution" garnered wide praise from *MT* readers, one former intelligence officer wrote to point out an error. In the article Moore wrote, "David Atlee Phillips stayed with the CIA until 1974 when he resigned, critical of the agency's workings."

"Nothing," says the fellow spy, "could be further from the truth. Dave Phillips (note spelling) resigned in 1975 because he was extremely concerned about slanted media reporting and efforts by certain members of Congress (e.g. Church & Pike Committees) to mutilate the CIA.

"Dave believed the public should be informed on the importance of a strong US Intelligence Community and it was his dedication to this cause that led to the formation of the Association of Former Intelligence Officers (AFIO)."

David Atlee Phillips passed away last year at the age of 66. He was widely praised by his colleagues as "a professional intelligence officer."

"Monitoring Times is great! I especially enjoyed the story on Malaysia. I'm able to log many of these stations," says Phil Richardson of Anchorage, Alaska, "but have never been able to get a QSL out of them -- no doubt I had the wrong address. Now I have some place to write."

"Not only is there a lot to listen to from Malaysia but also from New Guinea. Write to the National Broadcasting Commission, P.O. Box 1359, Boroko, Papua, New Guinea for a schedule showing 32 locations. Timothy Dickson was very prompt in sending a QSL for Mt. Hagen, trans-

mitting on 5965 kHz on the 49 meter band with 10 kw at 1437 UTC."

Many thanks for the info, Phil. Many of our columnists would be interested in hearing from such a successful DXer. Be sure to get some of those loggings and QSL reports off to Gayle Van Horn!

"I am a veteran deputy sheriff, and am interested in scanners, shortwave, and various types of radio equipment. In addition to using two-way radio in my job, I operate my own VHF two-way system. On this system we have three mobile units, a base station, and two portables. Also, we have SSB CB radios in our vehicles, as well as cellular telephones and scanners."

You would think that Charles L. Bloss, Jr. of Lecompton, Kansas, would be a prime candidate for amateur licensing. What holds him back from adding a set of call letters to his name? Says Charles: "The Morse code requirement."

"I enjoy talking on the radio. I don't want to listen to dihs and dahs. As long as Morse code is required, I will never apply for a ham license. Why should I? I can do all the talking I want without having to deal with Morse code. There is no incentive or reason for me to learn Morse and I refuse to do so."



Sending CW: A stumbling block or a standard of excellence?

Mike Boehly, NO3A, of Hazelton, Pennsylvania, disagrees, saying that it is necessary to keep Morse code as part of the ham radio licensing procedure in order to maintain both the service aspect of the hobby and high standards.

"Consider," he says, "the Part 97 definition of the 'amateur radio service' which the FCC describes as 'a noncommercial communications service, particularly with respect to providing emergency communica-

MT author receives prestigious award - p. 100

tions.' Although Morse may be considered an anachronism by Western standards, it is often the only way to communicate with underdeveloped nations in time of emergency.

"I take extreme exception," Mike continues, "to your pandering of the bootlegging freebanders. Why is it that these supposedly 'technically competent' hotshots are afraid to take a test that I have seen eight year olds pass? Is a license below their dignity? Try explaining to a police officer why you thought you need not take a driver's license test.

"We must maintain a certain discipline since, unlike shortwave listening, amateur radio is not just a hobby."

Viper, who lives in the northeast Bronx, doesn't care much for ham radio -- Morse code or no Morse code. "I would like it to be known that scanner and shortwave listeners are in a class of our own. A lot of us are *not* ham radio operators nor electronic technicians, though some of us are."

"With all due respect, let your ham readers go out and buy *CQ* or *73*. We are scanner and shortwave listeners and we are in a class of our own."

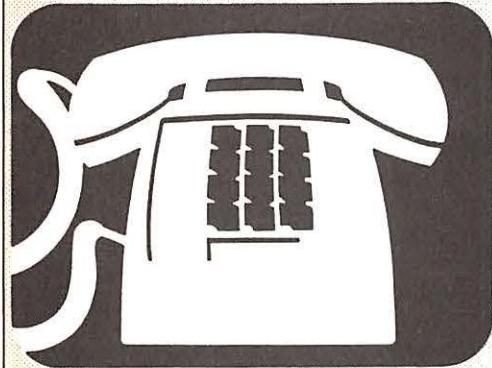
Carl Guderian of Houston, Texas, checks in with some commentary on illegal radio. "Not a whole lot [of information] about pirate radio and TV breaks the surface. The few reports I've heard are about Captain Midnight or the guys who broadcast from a freighter off the coast of New Jersey. Both got caught."

"Max Headroom did not get caught. He was a guy who broke in on a Chicago signal during the 10 o'clock news wearing a latex mask. It was in color, sound quality was poor and it looked like it was filmed in a closet. Max lurched drunkenly, mumbled for about 10 seconds, then went off the air."

"A few minutes later he reappeared, said something about 'being bad' and deserved 'punishment' ...

Cont'd on page 100

COMMUNICATIONS



Comrade? All I Hear Is Yodeling!

It was established some twenty-five years ago in the wake of what some says was the world's closest call with nuclear war, the Cuban missile crisis. ITT Corp set up the so-called "hotline" in 1963 after President John Kennedy expressed concern about the amount of time it took to contact Soviet leaders. It has run continuously since that time, ensuring a clear line of communications between the two governments.

Last month, the hot line was sold to a foreign company, the Swiss-owned Tele-Columbus USA.

The sale drew criticism from a number of quarters. Rep. Matthew Rinaldo of New Jersey, ranking Republican on the House Telecommunications subcommittee, said that he was concerned that the link, "which could make the difference between war and peace, is controlled by a third party."

Contrary to popular belief, the hot line is not a red phone sitting on the president's desk. Instead, hot line messages are transmitted from a small room at the Pentagon. The messages instantly appear on Soviet screens and can be printed out at the rate of 1,800 words a minute. Five years ago, the ability to send facsimile was added.

In order to ensure the integrity of the connection, U.S. and Soviet officials send test messages in their own languages each hour. The test

material is culled from literature and encyclopedias. (New Jersey *Courier-News*)

Free Television "Kidnapped"

Free television is being "kidnapped" by cable and pay TV interests. So says the leader of a broadcasting industry group in urging Congress to keep the airwaves free.

Nation Association of Broadcasters (NAB) President Edward Fritts said that the "unregulated monopoly" of cable TV must be reined in by Congress and that the unfair competitive edge that Washington lawmakers have bestowed on cable "must be rectified."

"A fair, competitive landscape must be restored," said Fritts. He urged other broadcasters to carry the message to the public and to Congress that free airwaves are "a right for all Americans."

Anderson Blasts Big-Spending VOA

According to a recent Jack Anderson column, the Voice of America has bungled its \$1.3 billion in "modernization" money so badly that "If VOA were in charge of the space program, it would still be launching monkeys into the stratosphere."

Anderson charges that the Voice "frittered away about \$400 million in overstaffing, overtesting and sheer incompetence."

"They [VOA] ran off all the people who knew about engineering," he quotes one source as saying, "and brought in people who couldn't find their butt with both hands."

Anderson cites as an example the "infamous" Moroccan relay station. The selected site was a lake. It took three years to fill the lake with dirt. The VOA claims it was the best of two

sites offered by the Moroccan government.

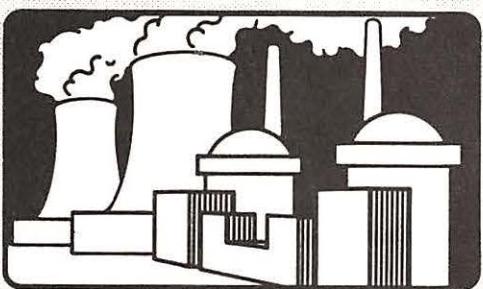
At this rate, concludes Anderson, "the government radio broadcast that is supposed to tout the American line around the globe in 44 languages would spend less money if it simply paid its listeners to convert to democracy." (*Times-News*, Lehighton, Pennsylvania)

Radio vs. the Atom

According to the U.S. Nuclear Regulatory Commission, they are two of the worst-run nuclear power plants in the country. The Nine Mile Point 2 reactor has never run for more than 30 days without a shutdown. Nine Mile 1 has been out of service since December of 1987. So officials of Niagra Mohawk Power Corp were understandably elated when the number two reactor was brought back on line. Then one of the workers keyed up his hand-held.

According to Robert Burtch, a spokesman for NiMo, the employee was operating his radio near sensitive circuitry. The radio shut down the electrohydraulic control system, used to control the flow of steam to the reactor's turbine, which in turn shut down the entire reactor. The cost of the error: \$350,000 a day.

Says reader Hans Tenney of nearby Baldwinsville, New York, "It kind of makes a person feel 'real good' about the power plant up the road. I'd write more but the lights are starting to flicker ..." (*Syracuse Herald-Journal*)



COMMUNICATIONS



That Daring Young Man...

Alvin Glaze, a ranger with the Louisiana Department of Forestry and Agriculture, had just climbed to the top of a 180 foot radio tower to begin dismantling an old antenna.

Suddenly, as two crew members on the ground looked up, Glaze fell backwards. About ten feet into his fall, the climber hit a set of guy cables which he somehow grabbed, riding them some 40 feet before releasing them, probably because of pain.

Glaze then free-fell several more feet, landing on another set of guy cables. He grabbed at them, managing to get his hands and one leg hooked around them as he slid toward the ground. He ended his descent as he nudged a building which the cables crossed, coming to a bouncing stop, head down, just a few feet from the ground.

Glaze suffered only abrasions, cuts to his arms and leg but no broken bones. Yukked the 46 year old father of three from his hospital bed, "They said it looked like a swan dive."

(*Radio World*)

TV Passes Middle Age

The 50th anniversary of the first public broadcast of television will be celebrated this year with special exhibits, commemorative TV shows (of course) and all sortsa of marketing fun and games.

Some of the most offbeat TV sets ever made -- such as the clear lucite-encased RCA model that FDR watched at the World's Fair -- are on display at the Smithsonian's National Museum of American History in a yearlong exhibit.

There will be antique but operative DuMont, Philco, RCA and Zenith sets playing "Golden Age" TV shows along with show artifacts such as Archie Bunker's chair, Fonzie's leather jacket and Buck Rogers' decoder rings.

The "look back" will have its poignant moments as well. During the 1950s, for example, there were 140 U.S. firms manufacturing TVs. Today, only two TV manufacturers operating in this country are U.S.-owned.

SCAN Founder Passes

Bob Hanson, W9AIF, died recently in Chicago while undergoing a liver transplant. Hanson founded the Scanner Association of North American (S.C.A.N.) in 1978 while working with Bearcat as their advertising agency's account executive. He was managing director until his death.

Few people realize it, but Hanson was responsible for conceiving the "Neighborhood Watch" anti-crime program, now in operation throughout the U.S. He was also a key player in getting NASA to make Space Shuttle audio available for retransmission by amateurs.

Hanson is survived by his wife, Marilyn, and two teenage sons. He was 47. (W5YI)

Pirate Broadcaster Shut Down

An unlicensed and illegal radio broadcasting operation in the Miami,

Florida, area was located and shut down recently. Representatives from the Federal Communications Commission and the US Marshal's Service seized the radio transmitter and other station equipment. The station, identified as "La Voz de Alpha 66" transmitted on 6666.6 kHz, a frequency set aside for aeronautical en route usage. The programming was in Spanish and appeared to be directed toward Cuba.

The transmitter was located in a motor vehicle and, as such, the station had been able to regularly change its transmitting location. The transmitter was operated by Diego Medina who previously had identified himself as the secretary of a group known as Alpha 66 Organizacion Revolucionaria Cubana. Administrative fines were imposed on that group in 1982 and 1983 for earlier unlicensed operations.

The unlicensed operation of a radio station violates Section 301 of the Communications Act. Violators may be subject to criminal penalties as well as civil forfeitures of radio equipment. The US Department of Justice is pursuing civil actions against the equipment and the violators.

Aeronautical en route frequencies are used by aircraft to transmit information related to the safe economical and efficient operation of their aircraft.

A potential for serious interference to authorized communications existed in that the unauthorized signals could be heard over a large portion of the United States.

You can communicate with other Monitoring Times readers. The next time you see an item about radio in a magazine or newspaper, clip it out and share it with the rest of us! Send it to Communications Editor, P.O. Box 98, Brasstown, NC 28902. You'll be glad you did.

20 Ways to Increase Your Scanner Enjoyment

by Edward D. Hesse, WB2RVA

Several years ago, I bought my first scanner. It was a ten channel model with search features. I was a babe-in-the-woods at that time, using the scanner primarily to monitor local two-meter ham radio frequencies. I was getting very little mileage out of the capabilities of that scanner. But over the years, I've learned a lot about scanners, primarily about getting more pleasure out of their usage.

Most of this information I picked up piece-by-piece, through experience, by listening to what I heard on the air, and by reading whatever I could. The purpose of this article is to pass along what I've learned to you, the reader. I've done everything I suggest, and most of it costs little -- if any -- money. Best of all, these ideas will increase your scanner enjoyment.

1: Car 54, Where are you?

When we buy a scanner, we generally plug

in the local police frequencies. And then we listen to it roll, channel by channel, as various calls are given to the police.

Instead of just listening to the general course of action on the frequency, you might choose one police unit and follow its progress through the day, noting the time of the call, where the unit was dispatched to, any calls from that unit for information or assistance, and then when it reappears on the air to take another assignment.

By doing this, you'll get a much better perception of the day of a typical unit, especially if you live in an urban or metropolitan area. This suggestion is good for the retired or house-bound individual or the work-a-week listener who wants to do something on holidays or weekends.

(This idea also works well with following arriving or departing aircraft.) Cost of this suggestion: absolutely nothing.

2: Catch more signals

The typical scanner arrives at your home equipped with a little (and we do mean little) whip antenna. For the first week or month, the novelty of listening to the action that's taking place overrides any lack of performance of the scanner. But if the scanner "bug" really bites you, you'll want to reach out farther and catch more signals -- and catch them more cleanly.

There are two ways to do this: one is to buy a more powerful whip antenna and use it as a replacement for the one you already have. The other way is a little more expensive, but it will move you into a listening class that will really increase your listening fun.

Get an outdoor antenna, one that will capture a wide spectrum of signals, and then mount it outdoors -- as high as you can. You'll hear more stations, and you'll hear them better. You might even think you've bought a new scanner because of the increased performance. The cost of this suggestion: it depends on the antenna you buy and the mounting hardware. And the expenditure is worth it.

3: If you already have an outdoor antenna, check out the coax cable

When I installed my first outside antenna, I was disappointed with the results and blamed either the antenna or the scanner it fed.

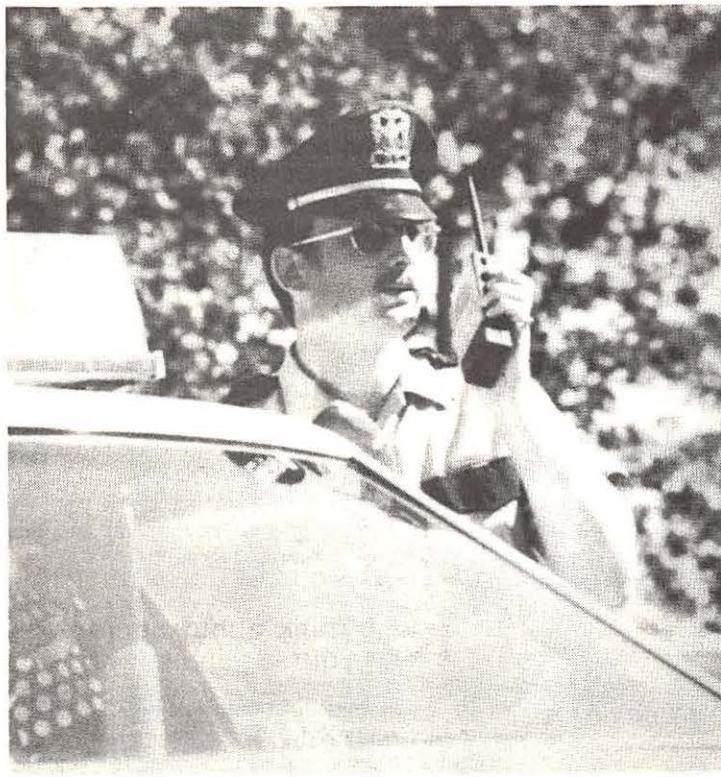
And then the thought struck me: could there be something wrong with the coax? After all, it was about ten years old and it was RG-58U. Was the coax "lossy"? Was there a break in it someplace? There was only one way to find out: replace it with high-grade RG-8U.

Instead of buying a pre-cut length (generally 50 feet) with coax fittings, I bought 20 feet of the coax (the correct length needed) and soldered the connectors myself. Soldering is not my major skill, but the results of the new cable told me that I had chosen the right solution. The cost of this upgrading of signal was ten dollars.



Motorola

You might choose just one police unit and follow its progress throughout the day.



Motorola
By "camping out" on a stake-out frequency of the local police, the transmissions were few but choice!

4: Use the search feature of your scanner

Most of us virtually ignore the search feature. We get into a habit of listening to our favorite channels and don't use the scanner to look for new signals. There's no "kick" like finding a new frequency that isn't in the frequency list directories, one that you found yourself.

There are a lot of these "hidden" frequencies out there, and the only way to find them is to choose a frequency range and then set the scanner to search that range. Cost of this suggestion: nothing. You've already paid for it when you bought the scanner. It's just that now you're using more of the equipment's capabilities.

5: "Camp" on a frequency that might produce an interesting transmission

Yes, I know, it's fun to listen to the scanner roll over all its frequencies, but every now and then, you might find it interesting to just sit on one frequency, especially a quiet one, that might produce an interesting exchange of conversations. This is recommended when you have some work to do that calls for more

concentration than usual, and when normal (scanning) use of your unit might prove to be distracting.

One night, I stumbled on a stake-out frequency of the local police. There weren't many transmissions, but those that took place were choice. Cost of this suggestion: again, absolutely nothing. It's already in your equipment.

6: Tape what you hear on a certain frequency, even when you're not home

The way to do this is to buy a voice-activated tape recorder (these are generally available at Radio Shack). For example, if you want to monitor a ham radio repeater frequency while you're away from home, simply place the tape recorder on top of the scanner, set the chosen frequency on "manual," and turn the recorder's power on. If a signal appears, the tape recorder will turn on. When it stops, so will the recorder.

It's an economical way to use your tape and electricity, and it will guarantee that any transmissions that take place in your absence will be recorded. The cost of this suggestion: as low as \$29.95, if you buy the recorder on sale.

AFFORDABLE RTTY-CW-FAX From Universal



The Universal M-900 is just right for the listener who wants an easy-to-use, affordable converter to decode all the basic shortwave transmission modes. The M-900 receives Morse code from ships coastal stations and hams. It also decodes regular (Baudot) RTTY still used by many international press agencies, weather stations and aero concerns. Both Sitor modes are also included to monitor maritime, diplo. and Amtor traffic. The M-900 even provides high resolution FAX images (to printer port only), so you can SEE pictures, maps, photos, and marine charts from around the world. A complete system will require your receiver, a monitor, a 12 VDC power supply and cables. A printer is also required for FAX mode only. Please write for full technical details including special system pricing. The M-900 alone is \$549.95

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7: Buy a good scanner frequency reference book and use it

My experience shows that most new scanner owners are at a loss as to what to program into their unit. They may have heard of one or two local police and fire department frequencies, but after that they're totally ignorant of the frequencies where the real action is taking place.

The way to overcome this lack of knowledge is to buy a book for your region and to choose the frequencies that look the most promising. In a short period of time, you'll find the ones that you enjoy the most. The cost: anywhere from seven dollars up, depending on the publisher.

8: Subscribe to a magazine like this one

One issue of this magazine will provide you with a large number of tips on scanners listing frequencies and so forth. You'll learn that there are many people "out there" just like you, who enjoy scanner listening and who do get a lot of fun out of it. Cost of this suggestion: a yearly subscription runs a little less than \$20.



Mark Swarbrick

Get family involved. Even those who don't enjoy scanning can't resist checking it out when the fire horn goes off.

9: Build your own scrapbook of frequencies

After I had been actively listening for a year or two, I decided to build my own scrapbook of frequencies. By reading publications such as *Monitoring Times* and by listening to ham radio frequencies (a lot of them love scanners, too), I picked up a lot of new frequencies and saw that the only way to organize and use this information was to put it in order in a looseleaf book.

I went to a stationery store and bought alphabetical page dividers and note paper and began to record what I had learned. It's been very useful in helping me organize my listening. The cost of doing this: about five or six dollars.

10: Set a weekly goal for finding new frequencies

You can do this by searching or by reading. All that you do is simply set a goal of new frequencies, such as "one new frequency a week." This appeals to the competitive urge in most of us, and keeps us going even on slow days. If you read of a frequency, put it in your scanner and verify that (a) it's a working frequency, and (b) it really is what the publication says it is.

For example, I read of a listing for our county's "fire academy." I put it into my scanner and, yes, there was activity on the channel. But if that's what they're saying at the academy, I'm going to buy a lot more fire insur-

ance soon. The channel seems to be used by county maintenance workers -- no great interest of mine -- and so it will be deleted by the time you read this.

The moral of this item: test every listing you get to verify that it is what it's claimed to be. Cost of this suggestion: nothing, except for the value of the time you spend.

11: Learn the "lingo" used on the frequencies you listen to

It's more fun when you know what they're talking about. For example, if you listen to two-meter ham radio repeaters, you'd like to know what's meant by such terms as "home QTH," "XYL," "the machine," and QSY to 52."

Police frequencies use a lot of numbers (the 10 code) and they're interesting (and sometimes challenging) to learn. For example, in New York City, a "10-13" means "assist police officer" which is a serious call for immediate help. And yet another police officer may use the "brave man's 10-13" which is a "10-87 forth-with."

The more you listen, the more you can deduce. The cost: just the time you spend listening.

12: Become expert in the frequencies you listen to

One way to do this is to listen only to one

type of broadcast, such as police, fire, or railroad. Find out what's going on, where, and why.

An excellent way to do this is to use the "banking" feature if your scanner has it. "Banks" are ways for you to separate scanned frequencies by the service scanned. For example, my PRO 2004 has ten banks (of 30 channels each) which I separate by type of transmission. Bank one contains two meter ham radio, bank two contains the county, town, and village police, and so forth.

My Regency HX 1500 has four banks. With banking, you can pick out the type of listening you want, depending on your mood and what's taking place on the air. The cost: nothing if your scanner permits banking. If not, you may want to upgrade your equipment, and this leads us to the next suggestion.

13: Think about upgrading your equipment

When most of us enter scanning, we do so rather tentatively. We don't know if we're going to like it, and we're hesitant to spend too much money. We generally start off with a ten channel job, with no search, thinking that "manual" and "lockout" are high-tech options. You can spend the rest of your life with such a scanner, but your enjoyment increases tremendously as the features increase.

I've already mentioned the search feature and being able to separate channels by banks. If you're going to buy a new scanner, you should also look for "priority" (automatically monitoring one channel while listening to others), a wider range of frequency coverage (for example, being able to listen to aircraft), higher scanning speed (to move more quickly to the next active channel), and the ability to program a number of search frequencies without having to reset the limits each time you want to search.

Perusing advertisements will let you know how much you have to pay for the extras that you want. Generally speaking, the more you want, the more it costs. But I must admit there's nothing like having a "world-class" scanner that lets you listen to everything that's out there. The cost of this super-scanner: that depends on your tastes and your pocketbook. Figure a minimum of \$400 to \$500 for such a unit.

14: Use the "priority" feature for "sensitive" frequencies

If you'd like to enjoy listening to all the channels in your scanner -- but would still like to know if something is taking place on a

sensitive frequency -- the priority feature is for you.

It checks the assigned frequency every several seconds in an unobtrusive way, and if nothing is happening, you continue to listen to the other channels of the scanner. But when something does take place, you're right there with the action.

For example, we had a propane truck accident several months ago, and the police assigned one frequency to the disaster scene. It wasn't always active, but when it was, I was able to monitor the action instantly. The cost: nothing if your unit has the priority feature -- and many of them do.

15 - If local law permits, take the scanner with you in your automobile

Who says that you have to listen to your scanner only at home? Personally, I like to take the scanner with me when I'm driving and want to listen to the local ham repeaters.

If your state has no restrictions, it's a lot of fun to listen to police and fire calls as you're driving around town. Many scanners come with a DX plug that you can connect to your cigarette lighter. If yours doesn't, buying such a cord and plug costs only a few dollars.

Just don't make the mistake of one local scanner listener who formed a very bad habit of always showing up at the scene of an incident that had just been reported on the police frequency. When it happened more than once or twice, it was too much to be a coincidence for the local gendarmes. The result: a summons for illegal scanner listening.

16 - Get your family into the listening action

My wife doesn't care to listen to ham radio transmissions, so I try not to have the scanner going when she's in listening range. However, I noticed that when the volunteer fire horn goes off, she asks me what's happening (and I instantly turn to the fire frequency).

Once I took the portable scanner to the beach when we were picnicking and tuned to the aircraft frequencies (we were several miles from Kennedy International Airport). She became very much interested in the aircraft transmissions, especially since we could see the various planes on their landing paths.

One of our sons, a police officer, borrowed one of my scanners to listen to calls in his area, and is now a confirmed scanner listener. I know several couples who both enjoy scanner listening. It's good family fun, it's more fun



Motorola

Tour your local police headquarters and see the people you hear on the air.

when several members listen, and it costs no more for several people to listen to one scanner.

17 - For finding new frequencies, consider buying a frequency counter

This is an electronic gadget that gives you a digital readout on the frequency of a transmission that is being broadcast nearby. For example, if you're at a shopping mall and want to know the frequency used by the security guards, a frequency counter will give it to you.

I purchased a counter for approximately \$130, and it's added a new dimension to scanner listening. You have to be discreet in using it, but it's a lot of fun to pick up -- in a few seconds -- the exact frequency a broadcasting unit is using. At least one manufacturer of these devices advertises regularly in this magazine.

18 - Join a local scanner club. If there isn't one, form your own.

Scanner listening should be a social thing. Although you can do it on your own, it's much more fun when you can join with a local group that has the same interests you do. This gets your family into the action, and you'll find that the club has social affairs, picnics, and so forth.

What better way to swap frequencies, and to stay tuned to what's taking place in your town? The cost of joining such a club: relatively little

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(\$10-\$20), depending on what activities the club provides.

19 - Arrange to visit the stations you hear

One local club arranged to tour police headquarters and see the "911" operation. It's one thing to listen to the calls on the air; it's quite another when you see the people who make these calls and how they operate.

Another group -- ham radio operators with an interest in aircraft -- arranged to tour the air traffic control facility. These visits cost nothing, and they help the "broadcasters" realize the quality of the people who listen to them on the air.

20 - Buy a CB rig or get a ham license and become part of the action

And then get on the air. Used CB rigs cost very little, and CB can form a good communications medium for scanner listeners. When a "hot" transmission takes place, the information can be broadcast over a channel monitored by club members.

Despite some abuses, CB is a wonderful way for friends to keep in touch around town. And many find that CB is a stepping-stone to the Novice ham radio license. Novices now have ten meter and "220" privileges. Once you get on the air, you'll be the one other people are listening to.

mt

Ed Hesse of North Merrick, New York, is a ham radio operator and self-proclaimed "scanner freak."

The Listener's Guide to Islam on Shortwave

by Jason Patterson

"Alahu Akbar" -- "God is Great" -- words which are said probably more than a billion times a day, every day, by the some 600 million Muslims -- followers of the Islamic faith. That already huge number of faithful is steadily increasing. In the United States, Islam is the fastest-growing religion.

Islam predominates in such countries as Egypt, Syria, Turkey, Saudi Arabia, Albania, Iraq, Iran, Pakistan, Afghanistan, the Yemens, Indonesia, Morocco, Tunisia, and Libya. And there are large Muslim populations in such nations as Lebanon, Yugoslavia, the Soviet Union, China, India, and the Balkan states.

The Islamic religion is intertwined with the daily lives of its followers to a degree perhaps equalled by no other major religion. Further, it is tied to greater or lesser degrees to the large and small wars, the hijackings and hostage takings, and much of the other turmoil and uneasiness in the Middle and Near East.

As a result, an argument can be made for seeking to understand Islam as the genesis of some of the events shaping several parts of the world.

Five Basic Duties

Followers of Islam -- Muslims (anglicized to "Moslems") -- must believe in and perform five basic duties. He must say, "There is no god but God and Muhammad is His prophet," five times per day (at dawn, noon, mid-afternoon, dusk, and night); he must pray, facing Mecca.

The Muslim must give alms generously and must keep the fast of Ramadan, ninth month of the Islamic calendar, the month in which Muhammad received the first of God's revelations. During Ramadan, a Muslim will not take food or drink nor engage in sexual activity during the hours between dawn and dusk.

And, if it is at all possible for the believer to do so, he will make at least one pilgrimage to Mecca during his life. This is known as the "haj."

There are also admonitions against drinking alcohol, eating or touching pork, gambling, slander, and so on.

The Islamic holy book is the Koran, believed to be God's revelations to Muhammed. It is supplemented by two other works. The Sunna or "way" or example of the prophet contains selected sayings and anecdotes of Muhammed. The Ijma is the principle of the agreement of Islam and is used to resolve apparent contradictions. Together, these three are the foundation of Islam.

Islam (Arabic for submission to or having peace with God) believes itself to be the fulfillment of Judaism and Christianity, and holds that Abraham, Moses, and Christ were actually preaching Islam, but that their teachings were changed during the years that followed. According to Islamic belief, only the teachings of Muhammed have remained unaltered and retain their original message even today.

As its history developed, however, Islam suffered a major division, splitting believers into Sunni and Shiite. The roots of this split lie in a dispute over the line of succession to Muhammed.

The Sunnis are the orthodox Muslims and represent an approximate 65 percent of the Muslims. Most of the remainder are Shiites who regard Muhammed's son-in-law, Ali, and his descendants as the true line descended from Muhammed.

Shiites believe the Sunnite caliphs usurped political power and religious leadership. The twelfth of Ali's descendants, Muhammad, is said to have vanished in a mosque in Samaria around 875-878 A.D. Shiites believe he will reappear one day as

The enormous influence of religious leaders like the Ayatollah Khomeini have brought Islam into world-wide attention.

the Mhadi -- the divinely guided leader who will purge the faith of Sunni distortions.

There are any number of small Muslim sects including those who believe Ali had only seven descendants and those who follow a sort of Islamic communism.

There is, of course, far, far more to Islam as a religion and a way of life than could even be highlighted in this brief sketch. Uncountable books on the subject can provide the reader with a more detailed study of Islam as a faith and all of its other applications in daily life and national and world politics.

In addition to book learning, however, the shortwave listener can take advantage of the "audio library" represented by his radio.

The shortwave listener who has the time and patience to do some careful tuning of the bands can search out a number of programs which can add insight to the attitudes, machinations, events, and other goings on in and between nations with Islamic governments or with mainly Muslim populations.

The programs we list here are aired in English. That's the good news. The bad is that not too many of them are carried as part of North American broadcast services and so may be difficult to hear some or all of the time.

Further, the broadcasters involved are prone to making fairly frequent changes in their schedules, frequencies, or programming line-ups, and, for that matter, may not even have supplied up-to-date information. Thus, the listing below is, like any listing of shortwave time and frequency information, subject to change -- even though it was as complete and accurate as possible when it was compiled.

Here, then, are some listening opportunities which will provide the interested



listener with more information and insight into the Islamic faith.

BANGLADESH> Radio Bangladesh airs a program called the *Voice of Islam* which is carried at 0800 to 0830 daily on 15195 and 17710. It is, however, one of the least likely to be heard due to the air schedule involved.

EGYPT> Radio Cairo has several programs which deal with Islam. One, *Islam and Community* airs at 1215 to 1230 on Tuesday. *A Religious Talk* fills that time slot on Fridays. At about 1230 on Mondays, a program on Muhammed's life is aired. The main frequency for broadcasts during this time slot is 17595, beamed to Southeast Asia.

On Friday afternoons, our time, about halfway through the 2115-2145 time block there is a program called *The Holy Koran and Its Meaning*. On Sundays at about the same time a feature on *The Religion of Islam* is aired by Radio Cairo. And during the North American service, at 0215 on Mondays, a program called *Islam -- A History, A Civilization* provides very good background information.

IRAN> Perhaps surprisingly, the Voice of the Islamic Republic of Iran airs very few programs along this line, though, of course, there's little English to be had from this station in the first place.

One program, *Recitations From the Holy Koran*, is carried at 1130 daily on 7230, 9520, 9685, and 11790 for portions of Africa, Asia, and the Middle East. On Mondays, a program entitled *Manifestations of the Islamic Revolution* -- a sort of "what hath Khomeini wrought" appears near the end of the 1120-1225 broadcast. Repeats of both of these come on during the 1930 English segment beamed to the mideast, Africa, and Europe on 9022.

LIBYA> Radio Jamaheriyah begins its English broadcasts to Europe and Africa at

1800 (15450) and the 2230 broadcast for Europe and North America (7245) with *Readings From the Holy Koran*. But there is little if any other time devoted to explaining Islam. Most of the hour is given over to peculiarly Libyan views on revolution, imperialism, and the Green Book.

KUWAIT> Radio Kuwait, in between its eclectic musical offerings, has four English language programs devoted to providing increased understanding of Islam. *Thoughts of Islam* airs on Tuesdays around 0500 on 15345. *The Spirit of Islam* is scheduled for the same time and frequency on Thursdays.

Better positioned for listening in North America is *Light of Islam* on Tuesdays and *Understanding the Holy Koran* on Thursdays. These are carried during the 1900 time block on 11665 and can often be well heard.

PAKISTAN> Radio Pakistan airs a program entitled *Islam -- the Religion of Today* on 9760 and 11570 (the former is never heard in the U.S. and the latter is difficult). This airs in the 1740-1800 slot on Fridays.

SAUDI ARABIA> The Broadcasting Service of the Kingdom of Saudi Arabia airs several programs explaining various aspects of Islam. *The Holy Koran* and *The Prophet Muhammed* lead off the 1600 English segment for Africa and the middle east on 9705 and 9720.

On Fridays at 1700 there is a feature entitled *Reflections of the Muslims*. Others in this time period which may provide insight into other aspects include *Solidarity of the Arabs* on Tuesdays, *Companions of the Prophet* on Wednesdays, and *Eve and Her World* which deals with the Muslim woman and society.

Around 1900 there is *Dictionary of Islam* and a feature which answers listener's questions about Islam. Shortly before 2100 there is a brief feature entitled *Gems of Guidance -- Sayings of the Holy Prophet*.

UNITED ARAB EMIRATES> The Voice of the UAE at Abu Dhabi airs *From the Holy Koran* daily at 2000. Frequencies for North America are 9595 and 11965.

Another program about Islam and women, *Women in Islam -- The Role and Activities of Women in Islam*, can be heard on UAE Radio, Dubai, during all of its English language segments. Probably the best of these for North Americans is the 1600 slot on 11730, 11955, 15300, or 21605;

or at 0330 to North America on 9640, 11940, 15435, or 17775.

A recent addition is *Palestine Under the Muslims* carried in the North American broadcast at 0345. UAE Radio, however, seems to change programming fairly often so these may no longer be aired.

It would seem logical to assume that other programs on Islam would be aired by such stations as Radio Damascus and Radio Baghdad, but no recent schedules could be located which included programming content and spot checks have not turned up any programs of this type. Readers who note any programs of this type should send the information to Kannon Shanmugam for inclusion into *Monitoring Times*' program section.

There seems an inexhaustable list of uses one can make of one's shortwave radio and learning about this major religion, which so often appears in our daily news reports in one form or another, is another advantage we can add to the long list.



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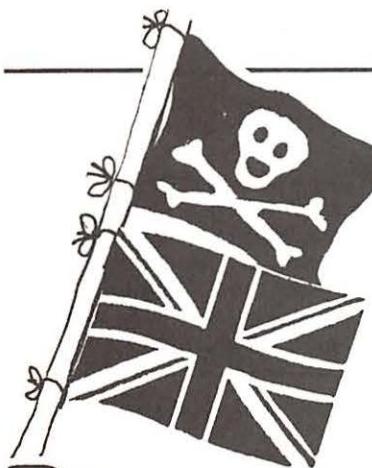
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The British Buccaneers

by John Santosuoso

Paul K. is an Anorak. Furthermore, he is proud of it. Nor is he alone. These days, despite efforts aimed at their extinction, Anoraks appear to be thriving in Great Britain, although their Irish cousins may be in for a bit of trouble.

No, an Anorak is not some sort of endangered bird species. Anoraks are modern day pirates, radio pirates. They are not guilty of stealing anything, only of broadcasting without a license. Judging from their current popularity in the British Isles, the pirates seem to be giving to their listeners a style of broadcasting which they welcome.

There are, of course, hazards to the game. If the authorities do not get you, then maybe the weather will. In fact, that is why the term "Anorak" originated. Pirate broadcasting by its nature often has to originate in remote and sometimes inhospitable places such as forests and mountain tops. To protect themselves from the elements, the broadcasters often wear a combination rain and overcoat known as an Anorak.

The name stuck, just as radio piracy has, in the British Isles. Paul Kay and his friends are happy doing what they are doing. They believe the appreciation of their audience makes the hardships of a dedicated Anorak worthwhile.

Although there were some earlier successful efforts, the real inspiration for the present Anoraks movement dates back to Good Friday 1964. That is the date on which offshore, commercial pirate **Radio Caroline** made its first broadcast to Britain.

Transmitting from the less than fully seaworthy *Mi Amigo*, within a little over three weeks Caroline's pop music programs claimed an enthusiastic audience of over one million fans. British radio would never be the same.

The BBC and some European broadcasters would try to counter Caroline's popularity with pop music efforts of their own. They were only partially successful. Despite the sinking of the *Mi Amigo* in a

March 20, 1980, North Sea storm, Caroline refused to die. By 1984 the station was back stronger than ever, transmitting from the *M.V. Ross Revenge*.

In 1988 shortwave transmissions began on a regular basis. Paul Kay declares, "Anoraks and their fans are all Caroline fans." It is their source of inspiration. What Caroline was successful in accomplishing they seek to do but in their own way and of course on a lesser scale.

If you are in the Shropshire area in the west of England on a Sunday afternoon, you may be fortunate enough to come across a broadcast by Paul Kay and his fellow Anoraks -- station manager Dave England, John Turner, and Dave Jones. Tune your receiver to 102.5 on the FM dial and see if their 35 watts of power are coming your way.

They call their station **Wrekin Radio FM** or the **Hot FM**. Paul explains the station takes its name from Mount Wrekin, the highest point in Shropshire. He is naturally vague about this but notes the name

is very appropriate, as the transmitter is often situated on a hill not far from Mount Wrekin.

The gang at W.R. has been at it for seven years now. They all got their interest in radio by listening to Radio Caroline. That enthusiasm has been maintained by the mail they receive and listeners' word-of-mouth advertising, which has given them a considerable Shropshire audience despite their modest power.

As previously mentioned, an Anorak has to be dedicated. The occupation is not without its risks and hardships. The folks at W.R. are well aware of this. When broadcasting, they do not glorify or even mention their unlicensed status. There is no sense in needlessly antagonizing the authorities or anyone else.

Despite this sensible approach, there have been several close calls. In February 1986 the station's equipment was confiscated in a raid. Fortunately the transmitting site was automated at the time, so no arrests were made.

There was an even closer call two years earlier. While attempting to locate the illegal broadcasters, the authorities walked right past their hidden location without realizing it. On another occasion they were warned of an impending raid and thus escaped detection.

Paul comments that other stations have not been as fortunate. Radio PCRL in Birmingham seeks to reach a primarily black audience. During its two and one-half years of broadcasting, it has been raided numerous times. Despite these hardships, it manages to go on, even seeking to maintain a seven-day-a-week schedule.

However, similar problems caused another Shropshire station, 300-watt, medium-wave **Sunshine Radio**, to cut back from seven days to one day of broadcasting per week. In London, where there may be as many as forty pirate stations, Paul remarks that some stations get busted two or three times a day!



If you sound as if you are having a good time, then people listening to you will have one also.

Still, they do not quit. For one thing, they often serve an ethnic audience which has no other voice. For another, many take paid advertising and find it rather profitable.

If avoiding being raided is one ingredient for a successful pirate station, others are just as necessary. How do you get people to listen to you?

Paul Kay claims the secret is to sound happy and be enthusiastic. If you sound as if you are having a good time, then people listening to you will have one also. He says that has not only been the key to Wrekin's success, but for others, such as Sunshine Radio, as well.



Of course, quality programs are essential. W.R., the Hot FM, thinks they have it. Now defunct, **Radio Enoch** in Coventry used to antagonize some people with its highly political right-wing programming.

W.R. avoids that kind of approach. There is no licensed local station in Paul's town, so the Hot FM seeks to provide solid coverage of local news. He says the station does accept a few advertisements, but the vast majority of these are really public service announcements. People depend on the station for news and information they cannot always easily obtain elsewhere.

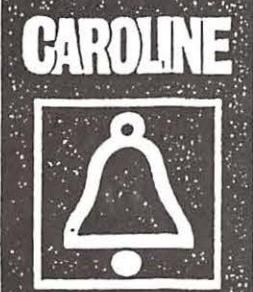
In the music department, W.R. seeks to attract area teens with a format of top-forty hits. However, they also try to entertain others as well by mixing in some oldies. Paul admits that, like typical pirates, they don't pay for the news they use or make royalty payments for the records they play. In fact, many of the records are given to them free.

What do Paul's parents think of all this? Believe it or not, his mother is one of W.R.'s most popular radio celebrities! Each week she narrates a story for young listeners. That

RADIO CAROLINE

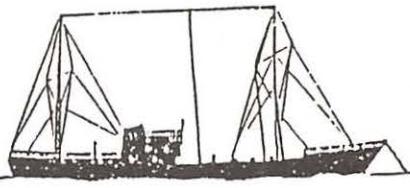
24 YEARS OF OFFSHORE RADIO

CAROLINE



1964-1988

558



RADIO CAROLINE

ALL THE HITS... ...AND MORE.

Anoraks and their fans are all Caroline fans, their source of inspiration.

may not be standard pirate fare, but the children love it and listen!

What is the future for W.R.? Paul Kay and his fellow Anoraks hope it is more of the same. From 1983 to 1985 they could operate more or less openly with only minimal concern about any government crackdown.

Still, as we have noted, there were problems even then, and now things are much more difficult. However, the Wrekin operation is essentially a portable one. Paul believes it can stay at least one step ahead of those seeking to shut it down.

And the Hot FM is by no means alone. According to Paul, at any given time there are

somewhere between seventy and one hundred pirate stations transmitting from Britain. About half of these are in the London area. For those which choose to go commercial, that can be an excellent market. Paul remarks that the "black disco" format has been especially popular for many of these broadcasters.

Another popular area for pirates has been the port city of Liverpool, where about eight to nine stations, many on medium-wave, are currently active. With the future of pirate radio in Ireland now very uncertain, some Irish stations such as **Radio Nova**, have also relocated much of their operations to Britain.

100w unit 29/11/88

Test Transmission.





radio Gemini

Sunday is 'GEM'day
SOUNDS OF SOLID GOLD
on
49 METRES

Dxpert Gregg Bares has had much success QSLing British pirates including England's Radio Gemini and Scotland's Weekend Music Radio.

The Caroline Roadshow is yet another factor which tends to keep the British populace enthusiastic about pirate radio and its style of programming. In fact, this traveling rock show remained active even while Caroline was off the air after the sinking of the *Mi Amigo*.

Its ties with the radio station are rather loose, but the magic name Caroline, and the similar sounds, are enough to motivate Anoraks and their supporters working to keep the pirate radio movement alive and well.

For the moment, at least, alive and well it is in Britain. In fact, in the fall of 1988, pirate radio operators, including Paul Kay, came together in the seaside resort of Blackpool to hold a convention. Even one American station was represented.

Reports about what took place at this meeting so far have been rather vague, but it seems likely that just being together will help to encourage the stations to continue their broadcasting efforts.

Irish Pirates Succumb to Government Pressure

Unfortunately, across the Irish Sea, in what was once the stronghold of pirate radio, things are not so well. There, Irish Anoraks are in deep trouble. For years, thanks to a loophole in Irish law uncovered by **Radio Dublin** and others, Irish pirates operated openly and usually commercially.

There was occasional harassment by the government, including some jamming. Pirates also sometimes preyed on their fellow pirates, even to the point of stealing their transmitters. However, for the most part, things went along smoothly and profitably, with the Irish government frequently threatening, but never acting, to pass legislation to ban the pirates.

In 1988 the situation changed. A law which spells doom for the glory days of Irish piracy finally made it through the Irish Parliament. All pirates were ordered to leave the air by December 31, 1988. Those that failed to do so face stiff fines of up to 20,000 pounds plus prison sentences.

More serious in the eyes of many station operators is the fact that a refusal to leave the air means they are ineligible to apply for the limited number of licenses which will be issued to commercial stations starting in 1989. No licensing provision at all has been made for shortwave, which Radio Dublin and several others had used to attract an international audience.

In addition, the fate of a station such as the one on the Irish border and beaming a signal on 1008 kHz into British-controlled Ulster is not clear. An Irish government seeking to maintain good relations with London might be most reluctant to legalize this operation even if it did comply with all licensing requirements.

Given the stiff penalties and the potential loss of commercial opportunity, Anorak Paul Kay believes Irish piracy is in for a drastic decline. It may not disappear entirely, but it most probably will at best be only a shadow of what it once was.

Could the same thing happen in Britain? Well, maybe and maybe not. In the meantime, on a Sunday afternoon, from somewhere near Mount Wrekin, you can still tune in the delightful sounds of the Hot FM. If you are lucky enough to get the chance, enjoy them while you can.

uniden

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Uniden Corporation of America has purchased the consumer products line of Regency Electronics Inc. for \$12,000,000. To celebrate this purchase, we're having our largest scanner sale in history! Use the coupon in this ad for big savings. Hurry...offer ends September 30, 1989.

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Bearcat® 145XL-T

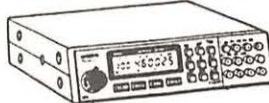
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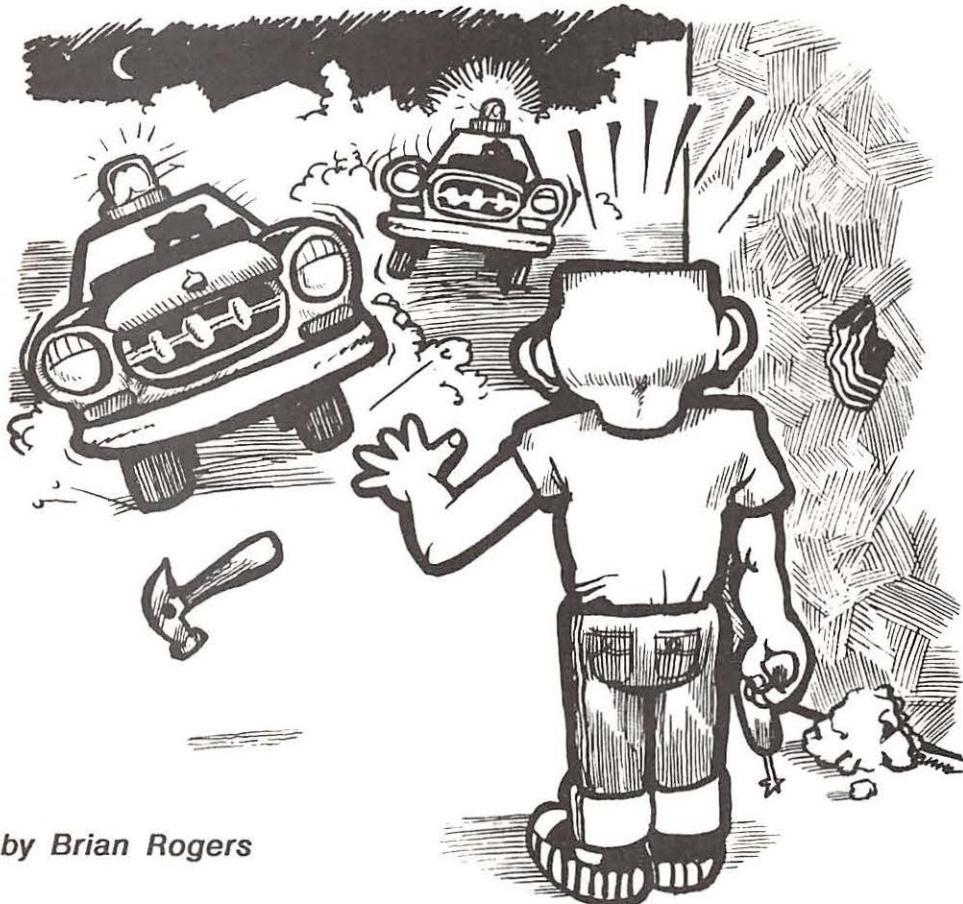
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HF Holdup



by Brian Rogers

The two police cars entered the alley from opposite ends of the block. Each hit the gravel at high speed, sliding to a stop, their blazing headlights scant inches apart.

"Whatcha doin' there, Sonny?" demanded one of the officers. "Lemme see whatcha got in your hands," said another. The beams of their flashlight beams blinded me and impaled me against the wall like spears.

"I-I'm making a hole for our antenna cable," I blurted in quivering terror and held out my hands for the policemen to see. One hand contained a hammer, the other a star drill.

"We got a call somebody was tryin' to break into the Youth Center," said one of the police officers. "We'll have to take you home. Curfew's ten-thirty and it's almost eleven o'clock."

The incident took place 35 years ago, but my mind can play it back now as clearly as the night it happened.

The saddest part was that the event was preventable. If the other four teenaged members of our city's Youth Center Ham Radio Club and I had realized earlier that the basement station and rooftop antenna were separated by 14 inches of concrete wall, I wouldn't have been in such a rush to punch a hole in the structure. After all, it was the night before Youth Center members staged their first-ever open house for families and friends.

About two years before my encounter with the city's finest, and subsequent free ride home, the community's Recreation Commission had appropriated money for a "Youth Center" building. Opening about six months before the open house, the facility offered, besides dances and other social activities, various

hobby clubs in which young people could explore such activities as stamp collecting, archery, astronomy, and amateur radio. The clubs were led by volunteer adult experts in those areas.

The amateur radio club advisor was a local ham who ran the town's TV repair shop. He met with us every Wednesday after school and taught us about AC and DC, resistors and capacitors, chokes and pots, diodes and triodes. We built code practice oscillators and taught ourselves about dits and dahs by working on our own and meeting sporadically in member's homes.

By early in the year following our club's September first meeting the five of us had earned our Novice amateur radio operator licenses and were ready to take part in the open house and demonstrate our skills to the public.

The station equipment was our own stuff hauled in for the occasion. The transmitter, as I recall, was someone's Heathkit DX-40, the receiver was my Hallicrafters S-38C. We pooled our money to buy antenna wire and cable.

I went back to the alley the next morning and, about an hour before guests began arriving, punched through the last of the concrete. It seemed no one minded my making holes in buildings if I did it in daylight.

Our one crystal was for a frequency in the 3.5 MHz Novice CW band, and we made several local contacts during the three hour exhibition. We turned the volume of the S-38C up to speaker-rattling level so people in all parts of the building could hear what we were doing and, hopefully, come watch us.

But I'll never forget the night the cops brought me home. Neither will my mom.



If you have a story of how radio has played a part in your life or the life of your community, send it to Monitoring Times. All stories should be true, real life events. Manuscripts should be approximately 1,000 words and include at least one clear photograph.



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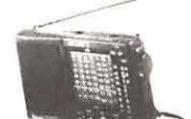
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The Last Radio Signal on Earth

by Wayne Mishler,
KG5BI

The snow was increasing. Large flakes splattered on the windshield as fast as the wiper blades could whisk them away. The rhythmic thumping of the wipers blended perfectly with the reassuring hum of the engine as it glided over the cushion of white that covered the road. All was quiet and warm. The speedometer registered 45 miles per hour.

In a few more minutes, Ken Averly would be with his mother. He had every reason to feel joy; instead, he felt a strange sadness. It was more than the bittersweet memory of this day, which had been marred 30 years ago tonight by the death of his father. It was more than the emptiness of living alone at age 47. It was all of these things, combined with the feeling of cautious suspicion and uneasiness over the recent turn-around by the Soviets. And now, they were calling for immediate arms control talks, promising a breakthrough in nuclear disarmament. As much as anyone, Ken wanted peace. But as a news reporter, he suspected that the proposal was a political ploy and this worried him.

When Ken turned into the driveway, he could see his mother peeking through the living room curtains. He got out of the car, loaded his arms with gifts, and made new tracks in the snow which crunched under his feet as he walked to the house. He stomped his feet on the front porch to shake the snow off

them. There was no need to knock. His mother had already opened the door.

"Thank the Lord you're here, son. I was worried. The radio says the roads are getting bad."

"It takes more than a little snow to keep me away from your house, Mom. I love you." Ken gave his mother a kiss on the cheek and put some gift on the table. The house was filled with the aroma of freshly-baked cookies.

Ken took off his coat and hat and hung them in the hall closet. He smoothed his short, dark-brown hair with his hand and turned and gave his mother a hug and another kiss. "God, I'm hungry. Those cookies smell good."

"I'll get you some, and some hot chocolate, too."

"Got any milk?"

"A whole gallon. You'd rather have that?"

"With your good cookies, any old day. Hot chocolate would cover up the taste."

His mother laughed.

They sat at the kitchen table. The cookies were still warm from the oven. They were carrot cookies with vanilla icing. He savored the first bite and sipped the ice cold milk. "These are my favorite, you know," he said.

"Always were. You haven't changed a bit."

"I've changed, Mom."

"Well, sure you have, in some ways. You're a man now. A fine man. God blessed me when you were born. Your father would be proud of

the way you turned out, son. You look like him, you know."

Ken's mother was right. He was a carbon copy of his father: a handsome man with muscular build, kind eyes, and strong will. Somehow, he had escaped middle-age bulge and balding which robs many men of their youthful appearance. After a few moments of silence, the mother spoke. "How long can you stay, son?"

"Gotta get back to the bureau day after tomorrow. I'm covering the arms control meeting next week."

"Lord knows we need it," the mother said. "Arms control, I mean. Sometimes I worry when the papers talk about nuclear war. I guess there's nothing that any of us can do but pray."

Ken was sorry that he had mentioned it.

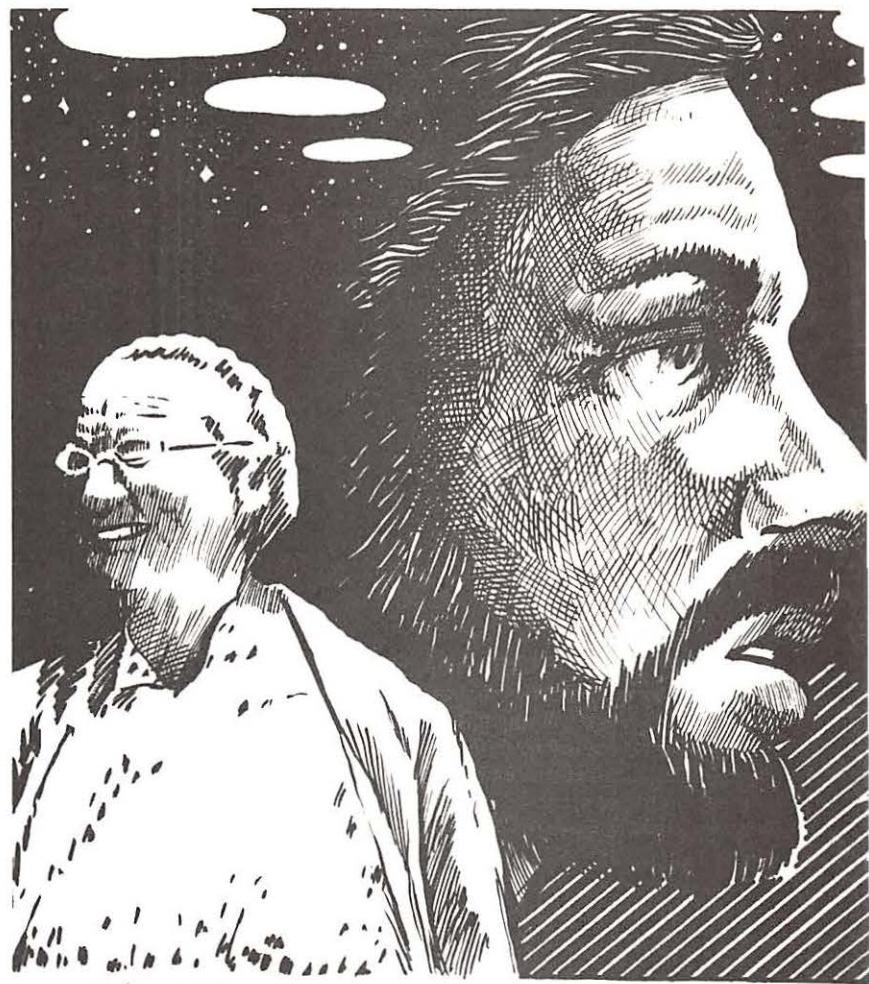
"Bob's home on leave from the Navy," the mother said. "He called today asking about you. He and Ann are expecting you for dinner tomorrow."

"You mind, Mom?"

"I guess not. I don't get to see enough of you, but it would be selfish to keep you all to myself."

"How's Ann?" Ken asked.

"Pretty as ever. She gets awfully lonely though. She never says so but I can tell. She comes over often and talks. It's rough on her, with Bob at sea so much."





Bunn 89

"She ever ask about me?"

"Uh huh."

Ken smiled and finished the last cookie.

"You want more? Got plenty."

"Don't tempt me. Gotta watch the weight. Women don't like fat guys."

"You're not fat. There's plenty of women who would count themselves lucky to get a man like you. When are you going to make me a grandmother?"

Ken laughed. "Someday."

They opened gifts and Ken said goodbye. He was staying at a hotel in town. His mother had wanted him to stay with her, but Ken was more comfortable staying alone.

It was the nightmares, mainly. Ken had never told his mother about them. They had started during his assignment as a war correspondent in Vietnam, and over the years had grown progressively worse. They came frequently and violently: human bodies being blown to fragments by Viet Cong mortar, helicopters spiralling down in flames, demons in black pajamas firing Russian made AK-47 automatic rifles and throwing hand grenades. Ken often awoke from these dreams screaming in terror.

He was seeing a psychiatrist, who had diagnosed the problem as Post Traumatic Stress Syndrome, PTSD for short, a kind of psychological reaction to the horrors of jungle

warfare. A lot of Vietnam veterans have it, Ken was told. He was a civilian in Nam, but as a newsman shadowing GIs in jungle combat, he endured the same hell that they did.

It was in Vietnam that Ken had met Bob, then a young Navy ensign assigned in an intelligence unit in Saigon. They often worked together. Bob was a brilliant intelligence officer. Ken found him to be a veritable library of background information. Bob would never leak secret information, but he had ways of steering Ken to worthwhile stories.

It was Bob who had introduced Ken to shortwave radio listening in Nam. During those sleepless nights with flares illuminating the countryside to expose Viet Cong infiltrators, and with U.S. 50-caliber machine guns blasting at shadows on the camp's perimeter, Ken found solace and enlightenment dialing the HF bands on an old Hammarlund receiver that Bob had given him. One of the Navy electronics technicians had built a small power supply which converted 12 volts DC to 110 volts AC, enabling Ken to run the old radio batteries. The system was crude, but it worked, and Ken had used it to keep abreast of world events.

Back at the hotel, Ken plopped on the bed. The 100 mile drive in the snow from Washington D.C. to his mother's home in Lansdale, a suburb of Philadelphia, had been

exhausting. He fell asleep rapidly.

He awoke at 9:37 the next morning, refreshed and grateful that his sleep had not been interrupted. After breakfast at his mother's, Ken drove to Bob and Ann's house in nearby Doylestown.

"Ken, you son of a gun. Hey, Ann, look who's here. By golly, Ken, you're looking great. How long's it been?"

"Too long, Bob. Good to see you, old buddy. Navy treating you okay?"

"Can't complain."

"Hello, Ken." It was Ann. She had walked in from the kitchen, arms outstretched. She and Ken hugged. "You hungry?" she asked.

"God, no. I just had breakfast at Mom's."

"I've got fresh coffee," Ann said. "How about a cup of that?"

"Sounds good. I take it black."

"I know," Ann said. She went back to the kitchen to fetch it.

Ken and Bob sat on the couch. Ann came back in and handed cups of coffee to the two men. Then she sat down to join them in conversation. Ken was glad.

"You still in the news business?" Bob asked.

Ken nodded. "White House correspondent for UPI," he said.

"Sounds exciting," Ann said.

"It has its moments," Ken replied.

"Bob's an intelligence officer with the Sixth Fleet," Ann said. "I don't see him much these days."

"You covering the Soviet visit next week?" Bob asked.

"As far as I know. I'm staying flexible though. The whole damned news staff is mystified by this thing. Tass says the Russians are promising a breakthrough in arms control. That's more than we have been able to get from the White House. We've been getting news reports of high-level meetings in the communist bloc. Bob, there is something in the air. I can sense it."

The phone rang. Ann left the room to answer it, touching Ken's shoulder as she walked past him. Ken touched her hand in acknowledgment.

"What's going on, Bob?" Ken asked.

"Off the record?"

"Of course."

"You're the only reporter in the world I would trust like this, you know."

Ken laughed. "Have I ever let you down?"

"I'm serious, Ken. This is not for publication. I wouldn't tell you, but as a friend, I feel that you have the right to know."

Bob looked over his shoulder to see if Ann was listening. She wasn't.

"Ever since the Star Wars program began, a number of factories in the communist bloc have been working around the clock. Last week we found out why."

"Ken, they are producing an entirely new



kind of doomsday weapon that we believe was designed and tested by Soviet engineers. We don't know how it works, but we have intelligence data on what it can do. It generates what appears to be an electromagnetic force field that travels at the speed of light and effectively destroys the human nerve system. It produces instant death in people and animals without having any effect whatsoever on hardware. This thing is small enough to be carried aboard a satellite, and so sophisticated that it can selectively wipe out the crew of a single frigate or the entire population of an area the size of Texas. It can be controlled by a UHF uplink from a ground control station operated by a half-dozen technicians."

"God. No wonder the Soviets are so willing to put their nuclear devices on the bargaining table," Ken said.

"We're not sure if the weapon is ready for deployment," Bob said. "But we don't intend to give them the chance."

"How would we stop it?"

"That'll probably be a major topic at the arms talks next week."

"Talk them out of it? Come on, Bob. Get real."

"It beats a military confrontation," Bob said.
"And if talk fails?"

"Use your imagination."

"A nuclear strike against the factories?" Ken asked.

"If necessary. Ken, we just can't let them deploy this thing. And we don't have the time to stop them with conventional war machines. As I see it, the president won't have a choice if things continue at the present rate."

"Do they know that we know?" Ken asked.

"We don't think so."

"What if they find out?"

"That's anybody's guess. They'll probably scramble to get what they can into orbit..."

Ann interrupted them. "Bob, the phone's

for you. It's the Navy." She looked pale. Bob got up to answer the phone and she sat down in his place next to Ken. "He's being called back off leave."

"I'm sorry. I'd better be going. You two need to be alone."

Ken drove back to the hotel to get his things and check out. It was mid-afternoon and the snow had stopped. He had time to get back to his house in Washington D.C. before dark. He figured the bureau chief would be trying to get in touch with him. He needed to be there.

He stopped by his mother's house to say goodbye. She told Ken she understood, but he knew she really did not. There were tears in her eyes.

On the way back to Washington, Ken could not get Bob's words out of his mind. As a reporter, he felt responsible for breaking the story. On the other hand, he could not betray Bob's trust. Ken doubted that the public could handle the truth. He wasn't even sure he could handle it.

With Bob being called back to duty, the launch of those Russian satellites could be imminent. Ken turned on the car radio and tuned in a 24-hour news station. There was a brief story of the arms control talks next week, but no mention of anything emergent. Ken found that strange, in light of what Bob had told him.

When he arrived at his house, Ken called the bureau to let them know he was back. A minimum staff was on duty. Things were quiet in the news room. The person who answered the news desk phone did not mention anything unusual on the wire reports. Ken did not ask for fear of saying the wrong thing and arousing curiosity.

He got a beer from the refrigerator and went to his radio room in the basement. It felt good to relax in his executive office chair. He swallowed several hefty gulps of the beer before stopping to breathe, then kicked off his shoes and leaned back in the chair. The room seemed especially peaceful in the soft red light that he had installed. It was a neat touch that he had learned from Bob, giving the radio room the feel of a combat information center aboard ship.

The heart of Ken's listening post was a large computer desk with a hutch that he had turned into a console for his radios. There was a control panel on the front of the desk with jacks for earphones and selector switches that allowed him to interconnect up to six antennas and radios without having to manually change coax leads. Another switch on the panel allowed him to connect any of the radios to a central speaker.

On the shelves of the hutch were four HF receivers, a minituner, two scanners, a tape recorder, a 24-hour clock, a container for

pencils and pens, and a supply of notebook paper. Ken kept notes on the paper as he listened and then filed them in a 3-ring binder. The notes were cross indexed in a computer database by date, time of day, frequency, type of station, transmitter site and country. This allowed Ken to sort, search and print out any combination of monitoring data that he needed when he needed it.

The computer, monitor, RTTY interface, and printer were located on another desk in the room, as far away from the radios as Ken could get them, to lessen the effects of interference. In monitoring RTTY, Ken ran a shielded audio cable from the console to the interface. The entire assembly was connected to a cold water pipe earth ground through a short length of heavy copper braid, which Ken figured improved the efficiency of his station.

Ken only used three of the HF receivers, which were state-of-the-art. The fourth was the old Hammarlund that Bob had given him in Nam. It had a special place under a plastic cover on the top shelf of the console. The old battery power supply sat alongside it. Both worked, but Ken never used them. He kept them as souvenirs. The two scanners were usually in constant use; Ken used them to keep up with news events in town. The receivers were connected through the console switching network to three antennas on his roof: a trap-dipole for HF listening and two multi-band verticals for the scanners.

Ken turned on one of the scanners and programmed it to monitor the bank of satellite frequencies. He did not have the antenna system that he wanted for this, but could get audible signals when satellites made overhead passes. Tonight, he was not interested in the local utilities; his mind was on what the Russians were doing. The scanner made tiny clicking noises as it changed frequencies, but otherwise was silent.

As the scanner's blue-white fluorescent display raced through its programmed frequencies, Ken turned on his favorite HF receiver, a new Kenwood R-5000, and checked the WWV stations to see which bands were strongest. As Ken expected, the 41 to 16 meter bands offered the most promise. He quickly dialed to the high end of the 40 meter ham band, set the receiver on upper sideband, and slowly began advancing the dial from 7300 kHz.

At 7315 he found a U.S. Air Force MARS station and listened for a moment. It was an emergency traffic net. Ken had never paid much attention to them in the past, but there was something unusual about this net: they were relaying orders from the Pentagon to U.S. military personnel at home on leave to report to their commands for duty immediately. Ken wondered why on earth the Pentagon would use this mode since they had

telephoned Bob. Then it dawned on him. To confirm his suspicion, he picked up his telephone and dialed his mother. He got a recording which said that all long-distance circuits were busy. The military was probably trying to use the telephones which were already at full capacity due to heavy holiday season traffic. MARS stations were handling the overflow.

Ken felt uneasy that he was separated from his mother at a time like this. He regretted having left her in Lansdale.

As he dialed, Ken noticed that English-speaking numbers stations were unusually prevalent. "The spies are working overtime," he thought to himself. At 9027 kHz he found the U.S. Air Force Strategic Air Command in a flurry of activity. That did it. Ken flipped on his other two HF receivers, a Kenwood R-2000 and an ICOM R71-A. He tuned the R-2000 to 6761 kHz which was alive with SAC transmissions. He used his computer to run a list of Air Force "Mystic Star" and Navy frequencies, entered these into the memory of the R71-A, and put this rig into memory scan.

A satellite CW beacon stopped one of the scanners, and Ken pressed the manual button to freeze the frequency — 153.48 MHz. That was a frequency on which Ken expected to hear the beacon of a Soviet Cosmos intelligence bird. The beacon was unusually loud. This intrigued him.

Using data from *The Satellite Experiment Handbook* and NASA prediction service, he checked the predicted orbits for Soviet Cosmos satellites and found no evidence that any of these birds were scheduled to be passing overhead at this time. However, this left another possibility: the flight may be a maneuverable recon which had been diverted to make an intelligence pass over the nation's capital. If so, it could conceivably mean that the Soviets were trying to intercept electronic communications data from the Pentagon to reveal any U.S. detection of the doomsday weapon launch.

If this was a recon bird, Ken figured it would make another pass in about 12 hours. He logged the time when the beacon appeared, 10:47 p.m. local, and set the other scanner to monitor three banks of government frequencies in D.C. Moments later, he heard both Andrews and Bolling Air Force Bases going on full alert. That's when the phone rang. It was the bureau.

"Ken, things are going crazy here. Every goddamn military base in the country is going on alert." It was the first time that he had ever heard the chief excited.

"Yeah, I just heard Andrews and Bolling give the order over the scanner," Ken said.

"Start packing. I don't know what's up, or where we need you just yet, but be ready." He

hung up before Ken could say anything else, and that was probably for the best. As yet, he had no confirmation on the Russian spy satellite or on anything that he had heard during the day, for that matter. But Ken was convinced in his own mind that the world was on the brink of nuclear war.

It was almost midnight. Ken remembered that he was hungry. He had not eaten since breakfast. He went into the kitchen and threw together a sandwich and got another beer, then went back to the monitoring post.

There would be time enough to pack, he figured, when the time came.

Ken tuned the R-5000 to the BBC on 5975 kHz. A news broadcast in English was in progress. The announcer was telling about the NATO forces being on alert. U.S. Naval forces were pulling out of the Mediterranean Sea. British attachés were being dispatched to Washington D.C. The arms control meeting with the Soviets next week was not mentioned in the 15 minutes that Ken listened. He dialed to Radio Moscow on 5980 kHz for that nation's perspective. There was no mention at all of the free world military alert, only the historic steps toward peace that the Soviets would introduce to the world at the upcoming Washington summit talks. Despite some amazing openness during Soviet reports of the Armenian earthquake, Ken was not surprised.

Meanwhile, the R71-A had intercepted an HF transmission from what seemed to be a U.S. Navy anti-submarine patrol aircraft on 6723 kHz upper sideband. The operator, a male voice, was calling COMSTA Miami. After several tries, COMSTA answered.

"Bravo Whiskey Quebec, this is COMSTA Miami, over."

"COMSTA Miami, this is Bravo Whiskey Quebec. We have emergency traffic. Over."

"Bravo Whiskey Quebec, this is COMSTA Miami. Roger. Out. All stations. This is COMSTA Miami. Request clear frequency for emergency traffic. Out. Bravo Whiskey Quebec, this is COMSTA Miami. State your emergency. Over."

"COMSTA Miami, this is Bravo Whiskey Quebec. Roger. Be advised. We have multiple contacts, unidentified submerged vessels, location 73 degrees 40 minutes West, 38 degrees, 12 minutes North, moving at 23 knots on bearing 267 degrees Azimuth. Request instructions. Over."

"Bravo Whiskey Quebec, this is COMSTA Miami. Roger. Stand by."

The frequency fell silent except for white noise. Ken grabbed for the world atlas to pinpoint the location. "God, that's on the doorstep of the Capitol," he said aloud. He picked up the phone and dialed the bureau. He told the chief everything.

"Goddamn, man, why didn't you say something sooner. Stay on the line for a writer. Give

him everything you've got. Then get your butt in here."

Ken told his story to the writer, then hung up the phone. The doorbell rang. It was Ann. There was a confused look on her face. "Bob called me from his plane. He told me to come here. He said you would know why."

"Come in please," Ken said. He took her coat and suitcase.

"How much has Bob told you?" Ken asked.

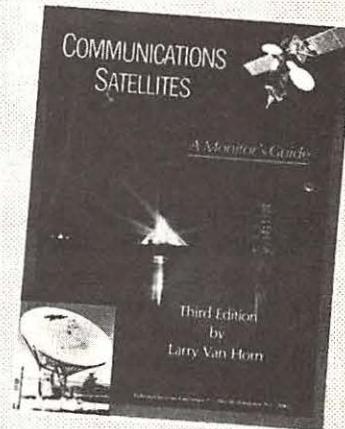
"Only that he is worried for my safety, and that he didn't know when he would be home again."

"Ann, sit down. I've got bad news. I have every reason to believe that nuclear war with the communist bloc is imminent. Bob thinks so, too. That's why he sent you here."

"Oh no. Oh God no. He's..." She covered her mouth to keep from saying the words she feared.

"Not just Bob. We're all in this thing," Ken

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said. He told her the whole story. "The attack may come at any time. We've got use every minute that we have to prepare."

"Your mother, Ken. She's at home alone."

"I'm going to get her. You can stay here in the basement."

"Ken, I'm frightened."

"So am I."

The phone rang. Ken knew it was the bureau. He told Ann to answer it. "Tell them I'm following a new lead on the story. Tell them I will contact them later."

She obeyed.

Ken ran to the basement to get his car keys which he had laid on the radio console. A voice crackling from the R-71A stopped him cold. Ken knew without looking at the digital frequency display that it was Mystic Star. He recognized the president's voice, who was apparently talking to an advisor in the Pentagon, out in the open, on a phone patch. The puzzle fell immediately together. The president was aboard Air Force One, enroute to Peterson Field, and in a few hours would be secure in the Norad Command Post from where he would direct the nation's military forces.

Ken ran back up the stairs. Ann was waiting for him with his coat. Ken could not help himself; he stood there for a moment, staring at her. There were tears in her large blue eyes, which had made little streams down both cheeks of her oval face. Her long, dark hair fell randomly on her narrow shoulders. She wore a white blouse, blue skirt, and matching spike heels. She was in her mid-thirties, five foot seven, and weighed 120 pounds. Ken took the coat from her, brushed the tears from her face with the back of his fingers, and then tilted her chin up. She smiled. Before he could stop himself, he kissed her. He was surprised — pleasantly so — when she kissed him back. "Be careful," she said.

Ken ran outside toward his car. Before he could reach it, the entire northern sky lit up like day. A brilliant white dome of light rose northeast of the city. Ken could not guess the distance, but it was terrifyingly close. Seconds later, there was a sudden flash of heat. It felt like being in a room with a thousand heat lamps. Ken did not move. A warm sensation of fear flooded through him, followed by panic, but he soon regained composure and walked back to the house.

"Too late, it's started," he told Ann.

"The war?"

"A nuclear warhead just exploded northeast of here. I saw it just now. I don't know how far away it was."

"Your mother?"

"My guess is that Philadelphia was at ground zero."

"Oh Ken, I'm so sorry."

"Ann, listen to me. We don't have much time. I saw the flash 90 seconds ago. I expect the electromagnetic pulse has already knocked out all communications. The sound of the explosion will be here in a few minutes, followed by the shock wave. I doubt that this house will stand up. We are going to have to take refuge in the basement. I need for you to start drawing water before the supply is contaminated. We'll need to store all that we can. There is a bathroom in the basement. You can draw the water there."

"We'll need food," Ann said.

"I've got several boxes of military C-rations in the garage. I brought them back from Nam. I figured they might come in handy someday."

Ann filled every container that she could find with tap water and covered the containers with a sheet. Ken brought down his six boxes of C-rations, then started to seal off the basement, when he remembered something. He dashed up the stairs to the garage, grabbed a crescent wrench, and then ran to the cars. He removed the batteries from both of them, carried the batteries to the basement, and then finished sealing off the entrance against the radiation cloud that was sure to come.

When Ken had finished, he noticed the silence. The radios were not working. He was not surprised. He had heard of the phenomenon. A nuclear explosion produces a brief but intense pulse of electromagnetic energy that blows transistors and ICs.

The silence was short-lived. A deafening roar vibrated the whole house, similar to but ten times louder than a roll of thunder. The roar rose steadily in intensity. Even with hands clasped over their ears, Ken and Ann could hear glass breaking upstairs. Ken shouted to Ann. His voice was lost in the roar. He grabbed her arm and pulled her into a corner of the basement and pulled a mattress over them.

The roar gradually subsided.

"That was only the sound of the explosion. The shock wave will be next," Ken told Ann. She was trembling in his arms. He could hear her crying.

"We're going to die, aren't we?" she asked.

Ken pulled her closer to him. "Ann, there's something I want you to know. I have loved you since the first day we met. I never said anything because I didn't want to hurt Bob or you..."

"Bob sent me to you," she said.

Ken knew from the embrace that she had accepted him. It was the most peaceful feeling that Ken had ever known.

Suddenly, outside, it sounded like a freight train bearing down on their house. A wall of wind tore at the roof and shingles and sent debris and loose objects flying like missiles through wood and brick like they were butter. The electricity went off, plunging the basement into pitch darkness. A tremendous thud jarred the whole basement, and in his mind, Ken could see the house being ripped apart and collapsing over the basement, trapping them inside.

The emotional trauma of it sent Ken into a PTSD flashback. He saw himself crouching in a bunker in Vietnam with incoming mortar filling the air with debris and smoke and terror. He heard human voices screaming and climbed out of the bunker trying to make his way to them. The earth seemed to explode around him as he ran, reducing reality to a bad dream in which he moved in slow motion.

His feet struck sandbags and he plunged headlong into a mortar pit with body fragments everywhere. He heard his name called and when he looked up he saw Bob hovering over him, hand outstretched. Ken grabbed the hand and Bob pulled him out of the pit moments before an incoming mortar round struck in the center of it. Bob yelled to him "Take care of Ann."

And as Ken watched, Bob's face lost its human appearance and took on the look of something inhuman, something alien to this earth. "Prepare yourself," the alien said. "It is almost time to go."

Ken was screaming when he regained his senses. Ann was embracing him.

"How long was I out?" he asked.

"A few minutes. It seemed like a lifetime," she replied.

"PTSD"

"I know. Bob had it too. The shock wave has passed. I think the house has fallen over us."

The dust was so thick in the basement that it stuck to their nostrils and turned to grit in their mouths. Ken made his way in the pitch darkness to his radio console. He felt around until he found a flashlight and some candles and matches. He lit a candle which gave off enough light for them to see.

He lifted the old Hammarlund from its honored resting place and sat it on the desk portion of the console. He connected the power supply to one of the car batteries and then plugged in the radio and turned it on. The dial lighted. He connected a speaker and heard white noise. Ken knew the HF antenna was down, but hoped there was enough of it left to pull in a signal. He searched around until he found the coax and connected it to the antenna jack on the receiver. There were signals. The radio's tubes had survived the electromagnetic pulse.

Ken had no idea what time it was. He could not find WWV and figured that Fort Collins had been hit, too. Tuning to 8101, he tried unsuccessfully to find the SAC airborne command post. He tried several other known SAC frequencies, 11243, 15041, 17975, 23337, 20631, and heard nothing. "Maybe those bands are not open," he said to Ann. He tuned to 6761.

A female voice, weak but readable, was transmitting: "Skyking, skyking, do not answer Oscar Charlie Golf, time 53 authentication Sierra Juliett, I say again . . ." The message was given three times.

Ken remembered reading in one of his radio magazines that this message was normally given only twice. He suspected the third repetition had crucial military significance.

"I think our retaliatory strike is enroute," Ken said.

He spun the dial until he found an English speaking broadcast station. It sounded like Radio Australia. The announcer was noticeably shaken. He told of a U.S. attempt to shoot down a Soviet rocket. In response, the Soviets had launched a nuclear strike against the United States. The first warhead had missed its target by a hundred miles, exploding over Philadelphia instead of Washington, but still had reduced the U.S. Capitol to rubble. Even so, the U.S., along with England and France, had launched counter attacks against the entire communist bloc. The atmosphere was literally ablaze with nuclear explosions.

Radio Australia suddenly went silent.

Ken quickly tuned to the BBC, which was announcing the nuclear counter strike. Europe had taken an unknown number of hits by Soviet missiles.

The BBC went off the air.

Ken searched for other international broadcast stations but found none. More out of curiosity than anything else, he switched to the 40-meter ham band and at 7250 kHz heard a weak but readable signal.

"There's nothing left here," the radio operator said. "The entire west coast is gone. I guess the nuclear explosions broke loose the San Andreas fault. Most of California is under water. Back to you, Al."

Static was steadily increasing.

DATAMETRICS COMMUNICATIONS MANAGER

SCAM MEMORY FILE Filename : MONITOR.FRQ							
---- Parameters ----				-- Status Indicators --			
Longest duration :	0	Frequency :	800.6000	Signal :	OFF	Time :	08:42:51
Minimum duration :	0	Monitor time :	1.05	Bounceback :	0	Scan rate :	0.65
Delay :	2						
Autolog (O,S,D) :	O						
Bounceback :	0						
Air rescue command channel							
800.0000	800.1000	800.2000	800.3000	800.4000	800.5000		
800.6100	800.1100	800.2100	800.3100	800.4100	800.5100		
800.5200	800.1200	800.2200	800.3200	800.4200	800.5200		
800.2300	800.1300	800.2300	800.3300	800.4300	800.5300		
800.0400	800.1400	800.2400	800.3400	800.4400	800.5400		
800.0500	800.1500	800.2500	800.3500	800.4500	800.5500		
800.0600	800.1600	800.2600	800.3600	800.4600	800.5600		
800.0700	800.1700	800.2700	800.3700	800.4700	800.5700		
800.0800	800.1800	800.2800	800.3800	800.4800	800.5800		
800.0900	800.1900	800.2900	800.3900	800.4900	800.5900		

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"Roger. Conditions are about the same here, Sam." This transmission sounded much louder to Ken than the previous one, leading him to believe that he was hearing the transmitter's ground wave. "I doubt there's a building left standing anywhere in D.C. I might be the only survivor. Sam, are you copying me okay? There was a fair amount of Q R Nancy on your signal on that last transmission. Go ahead."

"I'm not hearing any interference here. Must be on your end, Al. We'd better keep our transmissions short. These old tube rigs eat up the batteries."

The static grew rapidly worse. And then came a loud roar and whine overhead, sort of like the sound of a huge electric motor, causing the entire basement to shake.

"I can barely hear you, Sam. Stand by for a moment." There was a pause. "Mother of God. I'm not believing this. Sam, do you still copy?"

There was no answer.

A brilliant light suddenly illuminated the basement and then grew so intense that Ken could not see the basement at all. He could only see himself and Ann in a flood of light. For a moment, Ken thought he saw the alien creature that he had seen in his dreams a few minutes ago. The creature seemed to reach out to Ken. "Come, it is time to go," it said, and then disappeared.

At first, Ken was certain that he had seen and heard it, and then he was not sure. He looked at Ann but she was covering her face with her hands. The scene began to take on a kind of surrealistic quality. He was sure he was going crazy.

He could not explain the dazzling light which was slowly becoming transparent. In its weakening glow, Ken could see that they were no longer in the basement. Instead, they were in a room that resembled an airport. It was

spacious and pleasantly decorated. There was a large window at which a crowd had gathered. Ken and Ann walked to the window and looked out into space.

They saw a huge red ball surrounded by what appeared to be a flaming cloud. The ball was growing smaller and Ken knew that they were moving away from it and that he had seen earth for the last time. Somehow he knew that he and Ann and the others in this room which was retreating to another place safe from nuclear devastation had been chosen by someone or something to survive. And he knew that his nightmares which had been generated by terror on earth were no more. There was no fear. There seemed to be total peace and understanding and accord among the chosen.

Ken looked at Ann and seemingly could see deep into her thoughts. He saw love and admiration for him. "This is ultimate communication," he thought to himself. Ann nodded her head in agreement. She knew his thoughts also.

The couple knew in their consciousness that no one who had anything to do with the destruction of the earth had been chosen. Bob had not been chosen because of his military involvement. Ken sensed that his mother was somewhere in the crowd, that she had been plucked from the holocaust.

They hoped, too, to meet the two hams that they had heard on the air earlier tonight. They would tell Sam and Al about hearing their final radio transmission, a kind of reception report for the last radio signal ever.

Shortwave Broadcasting

Glenn Hauser

Box 1684 - MT
Enid, OK 73702



ABU DHABI Radio of U.A.E. from Abu Dhabi has expanded 11 meter band usage for the summer: 25670 to Japan at 0400-0600; 25900 to North Africa at 0200-0600; and to Europe at 0600-1600; all in Arabic, says a schedule issued Ramadan 17, 1409 (via Richard D'Angelo, PA) Proving the band is open when we check around 0400. Do not confuse this with another United Arab Emirate, Dubai, and its station, as a Sweden Calling DXers announcer persistently does, saying "Abu Dubai"!

AUSTRALIA ABC domestic shortwave services have automatic sign-on and -off, which means programming is interrupted at precise times. VLQ and VLM, Brisbane, on 9660 and 4920 do this at 1849 and 1404 UTC. The 50 kilowatt transmitter near Perth (at Hamersley on Wanneroo Road, not in Wanneroo as listed, is now used only on 6140 to avoid interference to nearby homes, which also prevents any future use of the site by Radio Australia. And explains why 9610, limited to 10 kW, is no longer a regular in North America. Schedule is: 24 hours on 9610; 2246-0919 on 15425; 0901-0104 on 6140. (Robert Jones, NSW, *World of Radio*)

CANADA Budget cutting at CBC prompts a revival of rumors that Radio Canada International could be hit hard, perhaps even closed down. Now's the time for letters of support to: Hon. Marcel Masse, Minister of Communications, House of Commons, Ottawa; with a copy to RCI.

CHINA Radio Beijing's higher frequencies for the summer: 17855 at 1100, 1200, 0000, and 0300; 11855 at 1300 and 1400, all direct. Relays from Mali move up too: at 0000 on 17715, 15130; 0300 on 15130, 11715; no longer mentioned at 1200 when it wasn't propagating anyway. All the Mali frequencies are off, causing heterodynes. In the mornings, 17855 often does surprisingly well; 11855 blocked only on Sundays by relay partner RCI with its weekly French equivalent of Sunday Morning. You never hear them mentioned on eastern North America broadcasts, but best reception remains via other relays for transmissions supposedly only for the west: 0300 on 9690 via Spain; 0400 on 11685 via French Guiana, 11840 via Canada.

COLOMBIA La Voz de la Cana is new on 5068 kHz from Cali, formerly Radio Tropical on 1500, no longer in the CARACOL net, heard from 2323 to 0050 with salsa music (J Carlos Perez and M. Molano, Spain; Henrik Klemetz, Sweden, *Play-DX*)

Meanwhile CARACOL has taken over Sutatenza frequencies 6075, 5095, 5075, 810 kHz. (Henrik Klemetz; Kirk Allen, OK) La Voz del Cinaruco was heard on 4680.4 at 0959; unclear whether a spur from 4865, or a mediumwave harmonic. (Bob Wilkner, *DX South Florida* via *Radio Nuevo Mundo*)

Radio Patria Libre, clandestine, active again on 6752 from 0052 to 0100 (Bjorn Fransson, Sweden, *SW Bulletin*)

CZECHOSLOVAKIA (non) Czechs now living in the USA can still pick up Radio Free Europe in the mornings, 1500-1800 UTC on 21720, 21530, sometimes 17835. BBC in Czech is well heard weeknights 0515-0530 on 9760 and 11865 via Cyprus. VOA Czech is sometimes heard via Morocco (Jaromir Macku, San Francisco) Summer schedules differ: BBC weekdays 0415-0430 on 6150, 7260, 9760; daily 0515-0530 on 6150, 7260, 11945. VOA Czech/Slovak is at 0400-0430 via Tangier 17855, Woofferton 11865, 9585.

ECUADOR HCJB has bought three used 30 kW SSB

transmitters from Switzerland, for transmissions, mainly on 11 meters, to Europe, North America, South Pacific (Harold Sellers, *DX Ontario*)

FRANCE Though missing from many schedules, RFI is listed in the ITU with a nondaily broadcast to Antarctica at 0800-0845 on 11880, 100 kW, 312 degrees from Allouis (Bob Padula, *DX Press*) I recall this used to be Thursday only. That route takes the signal over southern California and Tahiti, presumably intended for the base on the Adelie Coast, due south of Adelaide. Is anyone there this winter?

GUINEA Radio Nationale was heard at 0130 on 28496.86 kHz variable (M. Molano, Spain, *Play-DX*) That would be a fourth harmonic of 7124v.

INDIA All India Radio, Shillong, welcomes reports on tests: 132502315 on 7190, 232500415 on 3255 (Scott Edwards, CA) Is 50 kW, some evenings on 3225 instead, obliterating Simla 3223 (Manosij Guha, India, *Media Network*)

IRAQ Radio Baghdad heard in English at 2000 on 13660 (David Kernick, England) And more at 2100-2200 on 13660 (Tim Hendel, FL RCI *SWL Digest*)

ISRAEL Israel Radio, main frequencies in English during the advanced summer timings until September 3: 0400-0415 on 17575, 15640, 11585; 1000-1030 on 17575, 11585; 1700-1715 on 11585, 11655; 1900-1930 on 17590, 15640, 15615, 11605 (BEZEQ)



ITALY Radio Europe operates daily at 0800-1200, with tapes of lots of U.S. domestic stations, and WYFR in Italian; on 7295 Saturday, Sunday, and Monday; 27827 other days, with 100 watts. On good days, this might make it to North America. Report with 2 IRCs c/o Play-DX Via Davanzati 8, 20158 Milano.

European Christian Radio, Ravenna, 7355 or 9435, planned to inaugurate a 250 kW PEP SSB transmitter (Silverio Gomez, *Play-DX*)

JAPAN Oblivious of Radio Republik Indonesia's powerful home-service outlet operating on 11865 for some time, Radio Japan took over the same frequency direct to North America between 1200 and 1930, including English at 1400, 1500, 1700, 1900. Apparently taken aback by this new Japanese invasion, Indonesia disappeared from 11865.4 some days, but when on, caused a heavy het.

MONGOLIA Yet another country succumbs to DST unexpectedly, so Radio Ulanbaatar shifts its English broadcasts one hour earlier: 0810-0840 and (except Tuesday and Friday) 1100-1130 on 12015, 9615; 1345-1415 on 9615, 15505 (should that be 15305 as before?); and presumably 1840-1910 on 12050, 9985 (Tetsuya Kondo, *Radio Japan DX Corner*)

NEWFOUNDLAND CKZN, 6160 is not always parallel to CBN, 640; it had local rather than network programming when checked at 1650 during a visit (Gerry Bishop, *SWLD*)

NEW ZEALAND Proposed new site for RNZ is Rangitaiki, 40 km SE of Taupo, on the road to Napier. This has been the main site under consideration for the last decade to sesquidecade. It is in high plains country surrounded by state forests. I cannot see how it will be completed on time, early 1990; late 1990 or 1991 would be more realistic. (Robert Jones, NSW, *DX Listening Digest*)

NIGERIA Voice of Nigeria was once the major external

shortwave service in black Africa. It had eight high-power transmitters and North America was among its target areas. Frequencies included 15185, 15120, 11770, and 7255 kHz. But for the past two years only one transmitter was in working order, used on the lowest frequency to reach neighboring countries. Now that, too, has closed down.

An anonymous VON official told Agence France Presse, "We cannot continue to pretend to the world that we have an external radio service when all we have is an epileptic station, suffering from neglect. In spite of continual assurances by the government, nothing concrete has been done to solve VON's problems once and for all." (via Robert Valliant, Honolulu)

NORTHERN IRELAND A new free radio station, Triangle Nightime Radio, 98.5 MHz FM, says they hope to operate a shortwave service on 6273 kHz relaying TNR to the east coast of North America, UTC Sundays 0200-0500, live from Ireland. Reports with return postage are wanted: to Triangle Nightime Radio, The Strand Hotel, Strand Road, Portstewart, Co. Londonderry, Northern Ireland. (Gregg Bares, CT)

NORWAY Contrary to last month's item, we found Radio Norway transmissions still half a sesquihour following the summer schedule changes.

Ready to relay Denmark, but waiting on the Danish government to fund it; meanwhile, Denmark's transmitters stayed on. Perhaps this will start in July-September. (*Media Network*)

PHILIPPINES Only one shortwave frequency here is listed for domestic rather than external broadcasts -- DZB-2, FEBC Baco on 3345, per the World Radio-TV Handbook; the Tropical Band Survey says 3346.1, likely inactive. So I wrote the station. A reply from Sano Pablo, Program Supervisor, and Vicki Tweddel, for Tom Tweddel, Operations Supervisor, says though licensed 20 years ago, the station is new, supposedly on 3330, also known as Radio Pantribo, as it tries to evangelize the six tribes inhabiting Mindoro Island. Another name for it is Radio Mangyan Mindoro, and power is only 65 watts (Scott Edwards, CA, *World of Radio*)

Far East Network, Manila, heard on 15000 kHz at 1027-1100. (Dale Park, HI ASWLC) See also **SOUTH AFRICA**

SEYCHELLES FEBA schedules English until September, toward Asia or Africa: Saturday and Monday 0432-0505 on 15325 (Monday also on 17780); Sunday 0727-0820 on 15275, 17820; daily 1458-1610 on 11760, 15325 (Sunday until 1612 on both; Monday-Friday to 1625 on 15325) 1731-1804 (Friday and Saturday to 1824) on 11810 (*W.O.R.*)

SOUTH AFRICA A pirate in the Johannesburg-Pretoria area mostly relays Boputhatswana's Radio 702; also SABC Radio Metro in daytime; on exactly 15000 kHz, with time signal interference. (Richar Ginbey, Namibia, *Media Network*) See also **PHILIPPINES**

SPAIN The Canary Island local service heard on a Sunday at 1520 on 17715. (S. Gomez, Spain, *Play-DX*) Also at 2200 (Bob Padula, Victoria, *DX Press*) Hearing it ID as "desde Tenerife, Canarias" is not enough -- we have no reason to believe that inactive transmitters there are back. As previously reported, info from inside Radio Nacional de Espana is that the service is actually transisted from Iberia.

SRI LANKA TWR measured on 5972.8 at 1200 in English, instead of 11920. (Leigh Morris, Australia, *OzDX*) Deutsche Welle plans to have a staff of 12 engineers in place at Trincomalee by July, for full operations. (Peter Senger, DW, *Media Network*)

SYRIA Damascus in English at 2048 check on 15095 and 17711. (Hauser, OK)

TAIWAN Voice of Asia says English is now scheduled only at 1100-1200 on 5980, 7445, 9845. (Bill Matthews, OH, NASWA)

USA KJES, Vado, New Mexico, was slow to begin full operation; meanwhile, similar verse-chanting sponsored by

Missionary Radio Evangelism has been reported on KUSW, WHRI. A letter from KJES to Robert A. Nyman, Colorado Springs, Colorado, who heard them testing back in January, confesses that their only recording equipment at the time was a cassette with a built-in mike, on a stool.

The inactive KCBI, Dallas, has been sold to a church in Miami, for broadcasts in Spanish to Cuba (Ken MacHarg, IN) Perhaps connected with the earlier story of a Cuban group which finds Radio Marti insufficiently offensive.

You'd never know that the World Service of the Christian Science Monitor broadcasts in (gringo) Spanish, from its printed schedule, but one of the two WSHB frequencies splits away from 06 to 30 past the hour: 13760, 11980, 9455, 11930, 17555. (via Mrs. Leslie Edwards, Doylestown, PA) WCSN and WSHB shifted their regular announcements of frequencies and times to about 52 minutes into the second hour of program blocks. (C. Anthony Eck, Los Lunas, NM)

For weeks, months VOA repeated the same 15 minute test program about autos and bicycles on 21535 at 2200-2215, 2220-2235 and 2240-2255, carrier off between the repeats, and never a hint on whence or why.

USSR Radio Moscow has a new program called Newmarket -- where and how you can invest or sell your product in the USSR. On the North American service, Mondays and Tuesdays at 2220, next UTC days 0020, 0220, 0320, 0520; on the World Service, Mondays and Thursdays at 1945, 2145; next UTC days 0245, 0645, 1045. (via Kraig Krist, VA)

Radio Moscow offers souvenirs as prizes for their 60th anniversary contest, deadline October 1. Questions to answer: 1. When did you begin listening to Radio Moscow? 2. Why do you listen? 3. What features do you prefer? 4. what interests you about life in the Soviet Union? (Kevin Klein, WI)

Former jamming transmitters are now being used to broadcast home service programs from each republic so they can be heard in Moscow, but sites are supposedly in the Moscow area itself. Some of these may have been ground-wave jammers; higher shortwave frequencies would normally be useless for local coverage due to skip distances. Here's the summer schedule from BBC Monitoring, with my parenthetical comments:

Armenia	0453-1630 on 7175, 1635-1900 on 15110
Azerbaijan	0200-1730 on 7300, 1735-2000 on 15180
Belorussia	0215-1700 on 6150, 1705-1900 on 15270
Estonia	0230-1900 on 5900 (not there, heavy ute interference; maybe nearby?) 1905-2100 on 9560
Georgia	0058-1655 on 7125, 1700-1900 on 15240
Kazakh	0000-1700 on 9690 (also on 5945, but conflicts with Tashkent!)
Kirghiz	2257-1554 on 9735, 1550-1750 on 17785
Latvia	0300-1755 on 5920, 1800-2100 on 9695
Lithuania	0300-1600 on 6010, 1610-2200 on 9675
Moldavia	0215-1800 on 6075 (obliterated by Deutsche Welle at sign-on) 1805-1950 on 15360
Tajik	2315-1705 on 9785
Tatar ASSR	0230-1455 on 11945, 1500-1800 on 17810
Turkmen	0415-1555 on 7145, 1600-1800 on 17635
Ukraine	0000-1415 on 6030, 1420-2315 on 15385
Uzbek	0100-1625 on 5945, 1630-1900 on 17840

All are First Program except Azerbaijan, Kazakh, Ukraine, Uzbek -- Second Program.

Radio Station Pacific Ocean, IDing as "This is Vladivostok" and "Radio Pacific" during a five minute English segment Saturdays only sometime between 0740 and 0755 during a daily broadcast at 0715-0800 on 17870, 17825, 17805, 17645, 17590, 15595, 15425, 15330, and 9905 = USB (David Kernick, England)

YUGOSLAVIA New frequencies for English at 1200-1230: 25795, 21555, 17740 (Dave Kernick, England)

For much more news, monitor Glenn Hauser's broadcasts each week: World of Radio on WRNO, New Orleans: Thurs 1530 on 11965, 2300 on 13729, UTC Sat 0300 on 6185, 2330 on 13720, Sun 2030 on 15420. Also see DX news reports concluding each SWL Digest on Radio Canada International.

Shortwave Broadcasting

Broadcast Loggings

Let other readers know what you're enjoying.

Send your loggings to **Gayle Van Horn**
P.O. Box 1088, Gretna, LA 70053-1088

English broadcast unless otherwise noted.

0010 UTC on 5030

Costa Rica: Radio Impacto. Spanish. "Hit Parade Internacional" show with top Spanish hits. Promos for upcoming news, ads for "Banco de Costa Rica," and numerous station IDs. (Frank Hillton, Charleston, SC)

0015 UTC on 5025

Cuba: Radio Rebelde. Spanish. Latin pops and two Cuban rumbas. Canned Rebelde ID and time check. News bits and upbeat announcer presents U.S. pops. (Frank Hillton, Charleston, SC)

0015 UTC on 15110

Spain: Spanish Foreign Radio. Station ID as, "Spanish National Radio." International news, and discussion of Spanish interest in the occult. Science feature on Spain's war against AIDS. (Bob Hurley, Baltimore, MD) Monitored on 9630 kHz. (Bob Fraser, Cohasset, MA)

0015 UTC on 15640

Israel: KOL Israel. "Spectrum" show featuring medical and science reports on a new compound to cure irregular heart beats. Monitored on parallel frequency 11605 kHz. (Bob Fraser, Cohasset, MA) Audible on 11605, 15640, and 15615 kHz at 0000 UTC with "Israel News Magazine." (Harold Fodge, Midland, MI)

0020 UTC on 4770

Venezuela: Radio Mundial Bolivar. Spanish. Local time checks and promo, "Mundial Bolivar la Mas Popular." Pop Spanish tunes past 0035 UTC. (Rod Pearson, St. Augustine, FL)

0029 UTC on 6240

United States: Pirate. The Voice of Tomorrow. Opening with "Conquistador." Station frequencies quoted as 15040, 7410, 6240, and 1616 kHz. Announcement of "this is the alternative to the American media monopolies," followed by racist text at 0038 UTC. (Harold Fodge, Midland, MI)

0030 UTC on 11715

Mal: Radio Beijing relay. Report on the high status of professional cooks in China. (Bob Fraser, Cohasset, MA) (Aboe Thalip, Batang, Indonesia)

0030 UTC on 9925

Belgium: BRT. Station ID and newscast. Interesting feature on Brussels bike fair. Station ID at 0035 UTC, and harmonica tunes. (Rod Pearson, St. Augustine, FL) (Harold Fodge, Midland, MI)

0031 UTC on 4795

USSR: Asiatic SSR. (Ulan-Ude) Buryat Radio. Russian. Talk from Russian announcer and clear ID as, "Goverit Ulan Ude." Finally heard them after trying for two years! (Nick Grace, Harvard, MA)

0037 UTC on 15580

United States: Superpower KUSW. Good rock music. The Traveling Wilburys sing "The End of the Line." (Chris Hulse, Eugene, OR)

0040 UTC on 9765

USSR: Ukraine. Radio Kiev. "Open Studio" program on Russian Orthodox churches today. (Bob Fraser, Cohasset, MA)

0109 UTC on 9755

Canada: Radio Canada Int'l. SWL Digest program highlighted by Larry Magne's report on the forthcoming Grundig Satellit 500 portable receiver. Lots of fading and static! (Chris Hulse, Eugene OR)

0115 UTC on 15155

Ecuador: HCJB. "Passport" show with Rowena Turner and commentary on Peru's tourist attractions, including the Inca city Machu Picchu, Lake Titicaca, the Nazca Plain, and Lima museums. (Bob Hurley, Baltimore, MD) Monitored on parallel frequency 11775 kHz. (Bob Fraser, Cohasset, MA)

0122 UTC on 13730

Austria: Radio Austria Int'l. Classical music with Haydn and Beethoven selections. Host at 0129 says, "Beethoven stole the 20th century's thunder by inventing the first piece of jazz!" (Chris Hulse, Eugene, OR)

0140 UTC on 17815

Hong Kong: BBC relay. "Play of the Week, 'The Lion Rock,'" a somewhat surrealistic drama, not listed in the publication London Calling. Parallel on 15160 kHz considerably better signal. (Chris Hulse, Eugene, OR)

0240 UTC on 15580.5

Pakistan: Radio Pakistan. Slow-speed English news at tune-in. Closing announcements at 0245 UTC, and sign-off IDs for general overseas service. Fair signal observed, with parallel frequencies 15115 and 17660 kHz poor. (Aboe Thalip, Batang, Indonesia)

0300 UTC on 9680

Taiwan: Voice of Free China. Commentary on mainland China's one country/two system reunification proposal. (Bob Hurley, Baltimore, MD)

0305 UTC on 4939.6

Venezuela: Radio Continental. Spanish. Pop music, station IDs, local time checks, and city location. (Sheryl Paszkiewicz, Manitowoc, WI)

0310 UTC on 5960

Japan: Radio Japan. "This Week" program including a discussion on the gala six month expo to celebrate the founding of Yokohama. Commentary on ecological impact of Tokyo's development projects on Tokyo Bay. (Bob Hurley, Baltimore, MD)

0310 UTC on 6150

Vatican City: Radio Vatican. Commentary on religious holiday celebrations. (Bob Hurley, Baltimore, MD) Audible on 15180 kHz at 0000 UTC. (Bob Fraser, Cohasset, MA)

0315 UTC on 4970

Venezuela: Radio Rumbos. Spanish. Male announcer presents Spanish vocals, and canned "Rumbos" ID at 0323 UTC. (Frank Mierzwinski, Mt. Penn, PA)

0322 UTC on 9545

West Germany: Deutsche Welle. Current affairs feature on a treaty regarding shipment of toxic waste to third world countries. "Ah Yes, I Remember It Well" segment recalling Mussolini's initiation of fascism. (Bob Hurley, Baltimore, MD)

0335 UTC on 4780

Venezuela: Radio Carabobo. Spanish. Latin pops and instrumental ballads. Valencia time check with ID and promotional. (John Bougerois, Thibodaux, LA)

0337 UTC on 4920

Ecuador: Radio Quito. Spanish. Ecuadorian music and announced ID "Radio Quito" at 0345 UTC. (Frank Mierzwinski, Mt. Penn, PA)

0340 UTC on 11930

Bonaire: Trans World Radio. "Sounds of the Times" program, with discussion on the importance of family upbringing in formulating religious beliefs. (Bob Hurley, Baltimore, MD)

0340 UTC on 5055

Costa Rica: Faro del Caribe. Religious music and programming. Station ID and city location at 0354 UTC. (Frank Mierzwinski, Mt. Penn, PA)

0346 UTC on 4461.8

Peru: Radio Nor Andina. Spanish. Peruvian vocals and program announcements with mention of city Celendin. (Sheryl Paszkiewicz, Manitowoc, WI)

0350 UTC on 3250

Honduras: Radio Luz y Vida. Spanish. Talk between Spanish music selections. "Radio Luz y Vida" ID at 0358 UTC, national anthem to 0403 UTC sign-off. (Frank Mierzwinski, Mt. Penn, PA)

0355 UTC on 5045

Brazil: Radio Cultura Para. Portuguese. Brazilian music with only occasional breaks for IDs. (Frank Mierzwinski, Mt. Penn, PA)

0400 UTC on 5055

French Guiana: RFO Guyane. French. Male/female announcer duo with newcast, suffering interference from Costa Rica's Faro del Caribe. (Nick Grace, Harvard, MA)

0405 UTC on 3275

Brazil: Radio Difusora Caceres. Portuguese. Excessive heterodyne interference as male announcer talks. Brazilian pop vocals and station ID at 0422 UTC. (Frank Mierzwinski, Mt. Penn, PA)

0430 UTC on 5015

Clandestine: Radio Truth. Bird call interval signal at tune-in. Opening ID and political text to Zimbabwe. (John Bougerois, Thibodaux, LA)

0541 UTC on 11760

Cuba: Radio Havana. "Headliners" show. Announcements on 26th annual contest -- just name your five favorite RHC programs, and tell why they are your favorites! Win a trip to Cuba!! Yowser! (Chris Hulse, Eugene, OR) Audible at 0230 UTC on 11725 kHz with "As We See It" show. (Bob Hurley, Baltimore, MD)

0545 UTC on 17705

New Zealand: Radio New Zealand. Children's programming amid very weak signal. Maori programming heard subsequent evenings. First time in years I've heard this station, and I had to move to the west coast to do it! (Marc Kenig, Mountain View, CA) Welcome to MTI -ed.

0551 UTC on 9715

Bonaire: Radio Netherlands relay. "Media Network" show with visit to WWV, Colorado. Great signal on this frequency and parallel 6165 kHz. Did you know that an X15 solar flare is equal to a one hundred million megaton warhead? Scorchingly good report on current solar flare situation. (Chris Hulse, Eugene, OR)

0620 UTC on 14802

Kiribati: Radio Kiribati. Kiribatese/English. News broadcast in progress at



Trans World Radio

Bonaire
NETHERLANDS ANTILLES

1964 25 1989

Celebrating 25 Years of God's Faithfulness

tune-in. Signal exceptionally weak! Pacific news briefs and U.S. pop music. (Frank Hillton, Charleston, SC)

0630 UTC on 9545

Solomon Islands: Solomon Islands Broadcasting Corp. (SIBC). Local Island newscast. Weather/tide report and commercials in English and Pidgin. Reception was good until 0645 UTC. (Marc Kenig, Mountain View, CA)

0700 UTC on 11940

Gabon: Afrique Numero Un. French. Lively DJ with U.S. Top 40 Show of pop tunes. (Marc Kenig, Mountain View, CA)

0700 UTC on 15425

Australia: Australian BC Corp. (ABC-Perth) Top 40 music and news at 0730 UTC. Sports programming for the weekend included horse racing and cricket commentary. (Marc Kenig, Mountain View, CA)

0705 UTC on 6080

Canada: CKFX-Vancouver. "Golden Oldies" pop music program. Station ID, time checks for Pacific and Mountain Time Zones. Pacific regional weather forecast and continued pop tunes. Solid signal until Radio Australia sign-on at 0737 UTC. (Frank Hillton, Charleston, SC)

0731 UTC on 9640

Antigua: BBC relay. From the "Weeklies" program capsizing Nature magazine editorials, and drawing a parallel between animal rights and violent response to Salman Rushdie book. Also monitored at 2342 UTC on 15260 kHz. (Chris Hulse, Eugene, OR)

0930 UTC on 6135.3

Bolivia: Radio Santa Cruz. Spanish. ID between chat from announcers. Fair signal for Bolivian style vocals. (Frank Hillton, Charleston, SC)

1000 UTC on 2690

Indonesia: Jakarta, Himpunan Bhakti Sosial Radio. Indonesian. Dangdut music and 1015 UTC ID as, "Radio Himpunan Bhakti Sosial, Kiprahnya Kawula Muda Jakarta yang bekerja pada frekuensi 2670 kHz, di pancarkan dari: Jl. Tomang Raya, Gang Haji Lu, Jakarta Selatan." Arabic music at 1020 UTC to 1100 close down. (Aboe Thaliep, Batang, Indonesia) *This station is a nongovernment, noncommercial station, and can be heard on parallel frequency of 2670 kHz. -ed.*

1045 UTC on 2615

Indonesia: RPDT2. Indonesian. Talk and Arabic music program "Irama Padang Pasir" at 1050 UTC. Station ID and program preview at 1056 UTC. (Aboe Thaliep, Batang, Indonesia)

1105 UTC on 3905

Papua New Guinea: New Ireland. Radio New Ireland. Pidgin/English. IDs at tune-in to island choral music. Country and western, local time check, and today's date. (Frank Hillton, Charleston, SC)

1105 UTC on 2410

Papua New Guinea: New Guinea. Radio Enga. Pidgin/English. Regional news in Pidgin and English. signal fade out by 1120 UTC. (Rod Pearson, St. Augustine, FL)

1120 UTC on 3325

Papua New Guinea: Bougainville. Radio North Solomons. Pidgin. Talk by male/female duo mentioning Papua. Island choral music at 1130 UTC. (Larry Van Horn, Gretna, LA)

1125 UTC on 3245

Papua New Guinea: New Guinea. Radio Gulf. English discussion about the PNG government. Local announcements in Pidgin and signal chimes. (Larry Van Horn, Gretna, LA)

1125 UTC on 6120

Canada: Radio Japan relay. "Mailbag" program with a query on Japanese TV channels. (Bob Fraser, Cohasset, MA)

1125 UTC on 3986

Indonesia: Irian Jaya. Radio Republik Indonesia-Manokwari. Indonesian. Island musical ballad and national news items of Indonesia. (Aboe Thaliep, Batang, Indonesia)

1135 UTC on 11735

North Korea: Radio Pyongyang. Talk about the Korean society and "Radio Pyongyang" ID. Brief musical interludes between features. (Frank Mierzwinski, Mt. Penn, PA)

1153 UTC on 4790

Indonesia: Irian Jaya. Radio Republik Indonesia-Fak Fak. Indonesian. Classic pop tunes and local ID at 1155 UTC. Interval signal, time tips, ID as "Inilah Radio Republik Indonesia Fak-Fak, sebentar lagi mengikuti Warta Berita dari Jakarta." News relay from Jakarta past 1200 UTC. (Aboe Thaliep, Batang, Indonesia)

1200 UTC on 9580

Australia: Radio Australia. Report on political pressure toward Lebanon by surrounding nations, followed by shortwave propagation report. (Bob Hurley, Baltimore, MD) Monitored on 15160 kHz at 0704 UTC, with Pacific news roundup. (Chris Hulse, Eugene, OR)

1210 UTC on 5055.5

Indonesia: Irian Jaya. Radio Republik Indonesia-Nabire. Indonesian. Jakarta news relay from lady anchor. Orchestra anthem and local news. (Aboe Thaliep, Batang, Indonesia) *Thanks for the logs from your successful jungle DXpedition! -ed.*

1308 UTC on 11938

Kampuchea: Voice of Kampuchean People. Vietnamese. Station announcements from male/female announcers, followed by two beautiful Asian songs. (Aboe Thaliep, Batang, Indonesia)

1445 UTC on 25790

South Africa: RSA. Feature on South Africa's Kruger National Park in the northeast. (Harold Fodge, Midland, MI)

1715 UTC on 21750

Norway: Radio Norway Int'l. "On the Record" featuring women singers, with selections of folk, rock, and jazz music. (Bob Fraser, Cohasset, MA)

1723 UTC on 17835

Suriname: Radio Suriname Int'l. via Radiobras. Spanish/English. Interval signal to 1730 UTC. Station sign-on and English newscast for three minutes! Excessive interference from Spanish Foreign Radio. (Nick Grace, Harvard, MA)

1815 UTC on 11720

Canada: CBC Northern Service. Feature on the Royal Canadian Air Force, and sketch on hospitals and the economy. Parallel frequency 9620 kHz poor. (Bob Fraser, Cohasset, MA)

2201 UTC on 7415

United States: Pirate. Radio USA. Rock music and skits. Mr. Blue Sky with rebroadcast of a Radio Free London show. Station address given as P.O. Box 5074, HILO, Hawaii 96720, and "broadcasting from a leaky bathtub somewhere off the coast of North America." Noted technical engineer as Ubie, followed by sign-off at 2242 UTC. (Harold Fodge, Midland, MI)

2300 UTC on 15010

Vietnam: Socialist Republic Voice of Vietnam. News of Kampuchea. Discussion dealing with the traditions of the Tet festival. Vietnamese music to end of broadcast at 2357 UTC. (Bob Hurley, Baltimore, MD)

2305 UTC on 21555

Costa Rica: Radio For Peace Int'l. "World of Radio" program. Discussion on solar flares and elimination of double-daylight time in Newfoundland. (Bob Hurley, Baltimore, MD)

2330 UTC on 12095

United Kingdom: BBC. "Concert Hall" featuring Gustav Holtz's "The Planets." Heard on parallel 7325 kHz. (Bob Fraser, Cohasset, MA)

2332 UTC on 7416

United States: Pirate. United World Radio. Pop music and skits. Address given as "U.W.R., c/o Tagar, Room 258, Union Building, Stony Brook, New York 11794. Sign-off at 0000 UTC by announcer Mike Davis, closing Interval signal played was "What the World Needs Now Is Love." (Harold Fodge, Midland, MI) (Rod Pearson, St. Augustine, FL)

2350 UTC on 17835

Clandestine: 15 de Septiembre. Spanish. Anti-Sandinista propaganda by male announcer. Sound quality was poor. (Nick Grace, Harvard, MA)

2355 UTC on 11820

Ascension Islands: BBC relay. End of "Sandy Jones Request Show," station ID, and sign-off. (Bob Fraser, Cohasset, MA) Monitored at 0735 UTC on 11860 kHz with national news topics of Africa. (Chris Hulse, Eugene, OR)

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Larry Van Horn

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HF Regional Weather Broadcasts

A Monitoring Times Exclusive

Over the last several months, I have received a lot of mail concerning several new radioteletype and facsimile broadcasts that have popped up in the HF radio spectrum. These stations would broadcast RTTY weather coded and plainly worded messages on lower sideband, and facsimile weather charts on the upper sideband.

A lot of folks -- including me -- jumped on the band wagon and identified these broadcasts as coming from Carswell AFB just outside Fort Worth, Texas. The evidence seemed sound at the time. The Air Force weather identifier, KAWN, kept appearing on a lot of the traffic being sent from the station. From my old monitoring location in Orange Park, Florida, conditions and frequencies tended to support the midwest theory.

All was fine until one of our Ute World readers, Bill Eareckson, in Virginia, dropped me a note at P.O. Box 1088. Here is a portion of that letter:

"Enclosed is a printout of a station I monitored. The station IDs itself as KAWN. Text included 'National Public Service Unit-Dan McCarthy.' Transmissions contained weather station reports, flight terminal reports, and NOAA weather prognosis. If you have any info on KAWN, could you put it into your column."

Well, to be frank, I didn't have *anything* on this new obvious Air Force station. Also, to be honest, I love a challenge so I got on the phone. Should be easy; just call the weather guys at Carswell and they will solve the mystery. A quick trip to the information operator gave me Carswell Base information and she connected me to the weather office at the base.

The people at Carswell didn't know what I was talking about. They said, "We do not have any station on shortwave broadcasting RTTY or FAX weather." Boy, was I stumped. To make a long story short, numerous phone calls were made around the country to find someone who knew anything about KAWN.

I finally found someone at the U.S. Air Force Air Weather Service headquarters at Scott AFB, Illinois. MSGT David Black in the public affairs office said he thought he had heard of it but would have to check. Several phone calls were made and finally my knight in Air Force Blue got on the line with the answer. Chief John Kahn at the Air Weather Service office answered all my queries and then some.

John said, "I was wondering when you guys were going to call. I didn't figure we could hide that 10 kilowatt transmitter forever. The network is called the High Frequency Regional Broadcast service."

As John explained, the transmitter in question was not located at Carswell AFB (no wonder they thought I was a crazy sailor). The transmitter is located at Elk Horn, Nebraska, just outside Offutt AFB. It is all a part of the Air Weather Service's new HF regional broadcast.

In general it works like this. The transmitter sends out an

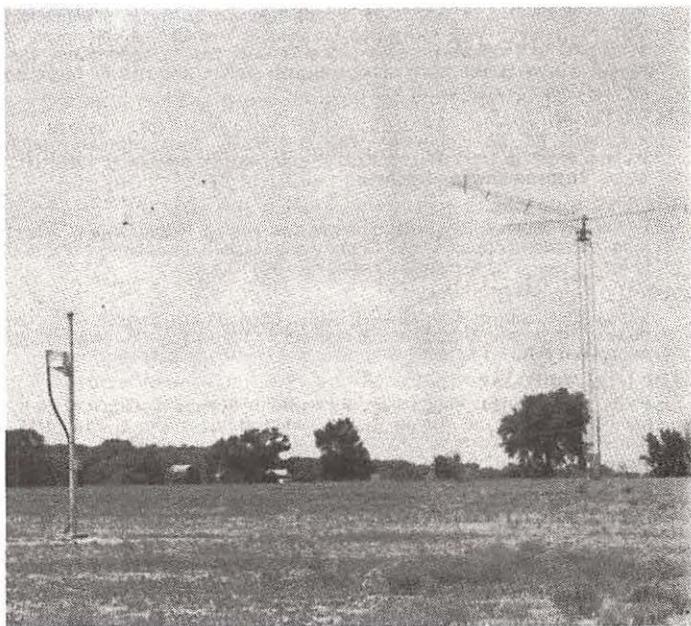
independent sideband broadcast. The FAX rest on the upper sideband and the RTTY is on the lower side. The transmitter sends out its signal to an antenna that has both a high and low takeoff angle assuring the attended receptors of a good signal no matter whether they are close or far from the transmit site.

The information broadcast comes from the U.S. Air Force Air Weather Service automated weather network. The broadcasts are intended for those units that are deployed and need weather information. They also serve the U.S. Army units that are deployed.

At present there are two stations operating, only one at full capacity on all frequencies. There will be eleven stations total in the network transmitting weather information by the end of summer. Locations include the forementioned Elk Horn, Nebraska; Elmendorf AFB, Alaska (partially operating as this was being written); Homestead AFB, Florida; Guam (probably Andersen; Phillipines (probably Clark); a couple of locations in Europe and one other undisclosed location.

All these stations will basically operate the same and provide tailored weather products to deployed units within their coverage areas. According to Chief Hahn, there are no set schedules for these stations of when or what kind of products will be sent over the air. He did mention that tropical cyclone (hope you read Hurricane Hunters last month) products would probably be available (I know amateur radio operators will be glad to hear this).

For the most part, broadcasts on these stations will be in the clear; however, they might have occasions to scramble some message traffic depending upon the deployed units they are sending to. FAX broadcast will come down the line at



US Air Force
Part of the antenna array at Elk Horn, Nebraska, HF Regional Broadcast Station (see June issue for additional photos).

120 rpm/576 IOC and RTTY will be broadcast at 74.2 baud.

As mentioned before, two stations are already on the air. The first station to come on the air was at Elk Horn in October. The station has no call sign issued by the Air Force and transmits on the following frequencies:

Night Frequency		Day Frequencies
3231 5096 6904		10576 11120 19326 kHz

The second station to come on the air was at Elmendorf AFB, Alaska. It uses the following frequencies:

Night Frequency		Day Frequencies
2280 3394 5096		10665 15805 19332 7398 kHz

By the time this appears in print, the station at Homestead AFB should be on the air. Listeners are invited to pass along any frequencies for this net to the author c/o The UTE World column address.

According to Chief Hahn, the verification policy is an open one. Reports can be addressed to:

Headquarters - Air Weather Service
Attention: Public Affairs Office
Scott AFB, IL 62225

So there you have it. The mystery is solved and the only thing we have to do is to sit back, listen and enjoy our new found friends on HF. Remember, you asked for it, you got it from the staff of *Monitoring Times* magazine.

Pacific Air Update

Clint Gilliland out in sunny California sent along the following update to the material carried in this column in the April issue. Clint says that the current solar cycle and the transition to the summer months are pushing the Pacific aero channels higher in frequency. The following frequencies are now quite active during daylight hours:

North Pacific (NP) 13273, 21946

Central East Pacific (CEP 5) 13288 (Replaced 13261)

Clint says that the 21964 frequency must be new as he does not show it on his list. Clint, my list shows this frequency to be assigned to Regional and Domestic Air Routes region W II. This area covers most of the eastern Pacific region. It should be a good frequency for Air Traffic Control comms during this high sunspot cycle period.

For the complete picture of Pacific aero comms, Table 1 lists all the current Pacific aero channels and stations.

Monitoring Sunspots

Speaking of sunspots, Clint mentions that the increased solar activity has improved ionospheric propagation conditions generally. Recent flares and Sudden Ionospheric Disturbances (SIDs, also known as Fade Outs) have caused problems for air route HF communications in general. One recent SID rendered the HF band totally dead for more than an hour mid-day Pacific time. Solar flare effects several days later made the signal propagation so poor that Clint heard a Federal Express plane passing a position report via a relay through a United flight.

Clint also passes along the following tips for observing solar activity on the face of our sun. Up front, please let me warn you -- please, please do not look directly at the sun either directly or through any optical devices. Damage to

Pacific Basin Aero Channels Table 1

Central West Pacific (CWP-1)							
Hong Kong	Hong Kong	(127.1)					
3485	5655	6532	8903	8942	13300	13309	
Manila, Philippines	(124.9)						
2998	6532	6562	8903	13300	17904		
Naha, Okinawa	(126.9)						
Port Moresby, Papua New Guinea	(120.9)						
2998	6532	8903	13300				
Taegu, South Korea	(125.7)						
6425	6665	6675					
Taipei, Taiwan	(127.3)						
6532	8903	13300					
Tokyo, Japan	(127.3) (127.4)						
2998	4666	6532	8903	13300	17904		
Central West Pacific (CWP-2)							
Guam							
2998	6532	8903	11384	13300	17904		
Honolulu, Hawaii	(131.95)						
2998	4666	6532	8903	11384	13300	17904	
Manila, Philippines	(124.9)						
2998	6532	6562	8903	13300	17904		
Naha, Okinawa	(126.9)						
2998	4666	6532	8903	11384	13300		
Port Moresby, Papua New Guinea							
2998	6532	8903	13300				
Tokyo, Japan	(127.3) (127.4)						
2998	4666	6532	8903	13300	17904		
North Pacific (NP-3)							
Honolulu, Hawaii							
2932	5628	6655	8951	10048	11330	13273	17904
Tokyo, Japan	(126.7)						
2832	5628	6655	8951	10048	11330	13273	17904
North Pacific (NP-4)							
Honolulu, Hawaii							
2932	5628	6655	8951	10048	11330	13273	17904
Central East Pacific							
Honolulu, Hawaii	(131.95)						
3413	5547	5574	8843	11282	13288	13354	17904
San Francisco, California	(131.95)						
2869	3413	5547	5574	6673	8843	10057	11282
13288	17904						
South Pacific (SP-6)							
Auckland, New Zealand							
3467	5643	8867	13300	17904			
Nadi, Fiji	(126.7)						
3467	5643	8867	13261	17904			
Sydney, Australia							
3467	5643	8867	13300	17904			
South Pacific (SP-7)							
Honolulu, Hawaii	(131.95)						
3467	5643	8867	13261	17904			
Nadi, Fiji	(126.7)						
3467	5643	8867	13261	17904			
Pascua/Easter Island	(126.9)						

your eyes will result from doing either of the aforementioned events. A safe way to observe the sun is to project an image of the sun on a piece of paper using ordinary binoculars.

Hold a piece of paper just into the shade, while you hold the binoculars about three feet away in the sun. Point the binoculars at the sun and move them until an image exits the eye piece. Move the image to your paper and focus. The image should be around three to six inches in diameter. Spots are easily visible. Recently Clint noticed a huge spot cluster plus a few small spots visible on the sun's surface using this method.

Many thanks to Clint Gilliland for this interesting report and now it is time to visit the loggings section from the world of utilities . . .

Utility Loggings

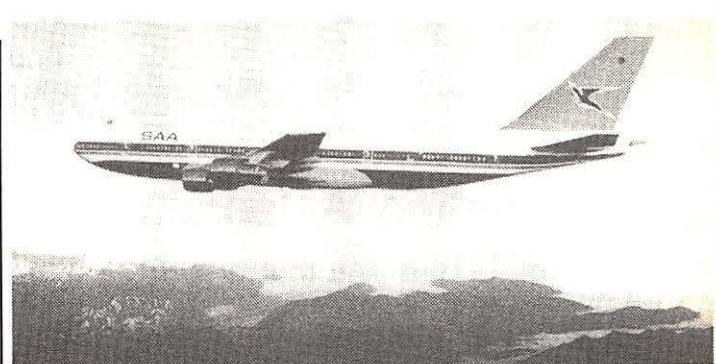
Abbreviations used in this column

All times UTC, frequencies in kilohertz. All voice transmissions are English unless otherwise noted.

AM	Amplitude modulation	ISB	Independent sideband
ARQ	SITOR	LSB	Lower sideband
CW	Morse code	RTTY	Radioteletype
FAX	Facsimile	UNID	Unidentified
FEC	Forward error correction	USB	Upper sideband
ID	Identification		

- 3608.3 GCC1-Cullercoat Radio, England, heard at 0430 sending a CW ID and ARQ phasing signals. (Sundstrom, NJ)
- 3615.7 GND1-Stonehaven Radio, England, at 0450 sending a CW ID and ARQ phasing signals. (Sundstrom, NJ)
- 4134.3 SV Traumerl (WTU-5155) working NMN-Portsmouth and NMF-Boston CG COMSTAs. Reported a flare sighted at 3918N/7358W at 0047. Boston and Portsmouth were causing interference so vessel couldn't hear either. (Bill Battles, East Kingston, NH)
- 4266.5 TCR-Istanbul Radio, Turkey, sending a CQ CW marker at 0056. (Jack Dix, NY)
- 4343.0 WLO-Mobile Radio, Alabama, heard at 2025 with a CW schedule of transmissions. (Sundstrom, NJ)
- 4350.0 TBB5-Ankara Naval Radio, Turkey, heard at 0342 sending a V CW marker. (Dix, NY)
- 4910.0 KWS78-U.S. Embassy, Athens, Greece, sending QSX de KWS78 and a list of frequencies in CW. (Sundstrom, NJ)
- 5208.0 DEB-Interpol Wiesbaden, West Germany, sending SITOR-A messages at 0300. (Sundstrom, NJ)
- 5643.0 Hawaiian 1471 working Nandi ATC in USB at 0814. (Battles, NH)
- 5703.0 Croughton (GCCS) AFB, United Kingdom, with aero weather broadcast in USB at 0055. (Battles, NH)
- 5718.0 Rescue 112 working St. John's Military, Canada, with a phone patch to Halifax RCC. Requested whether they wanted an infra-red search done on the SAR mission in USB at 1954. (Battles, NH)
- 6200.0 USCGC Tahoma (WYTL-65604) working NMN-Portsmouth CG COMSTA in USB at 1530. (Battles, NH)
NOAA Ship Delaware II (KNBD) working NMF-Boston CG COMSTA with report of a capsized vessel at position 4223N/6950W. No one near the scene. Heard using USB at 1524. (Battles, NH)
- 6716.0 Quebec 5 Zulu working Halifax Military in USB at 1731. (Battles, NH)
- 6760.0 Plymouth Rescue (UK) working Rescue 54 and 56 with SAR air mission traffic in USB at 0105. (Battles, NH)
- 8146.0 IMB55-Rome Meleo, Italy, with FAX (120/576) weather maps. Poor signal. (Sundstrom, NJ)
- 8455.0 UVA-Unknown Russian Marine Station sending a CQ CW marker at 2103. (Dix, NY) Any help on this one, readers? -ed.
- 8457.0 PKP-Dumal Radio, Indonesia, sending CW CQ marker at 1039. (Dix, NY)
- 8461.0 CBA-Antofagasta Radio, Chile, heard at 0146 sending a V CW marker. (Dix, NY)
- 8465.0 "Sierra Yankee November 2" repeated by a female English operator at 1932. (Dix, NY) Probably an Israeli Moshad station. -ed.
- 8500.0 1H heard at 1229 sending the following CW message: "VVV S6 S6 S6 de 1H 1H 1H NR-R-280835-DIC-880 FLNR-1006 FM 1H (34/D) to S6 GRSC (NC)." A long message followed in Spanish plain language with information about an infantry school with service numbers and personnel names. Station faded and became unreadable at 1307. (Dix, NY)
- 8515.0 SAT-Tripoli Radio, Libya, heard at 2128 with a V CW marker. (Dix, NY)
- 8523.0 RIW-Khiva Naval Radio, USSR, at 1142 working an unidentified station. (Dix, NY)
- 8526.0 JCM-Tokyo Radio, Japan, sending a CQ CW marker with the call signs JMC/JMC2/JMC3/JMC4 at 1331. (Dix, NY)
- 8567.9 FUV-Djibouti French Naval Radio, Djibouti, sending a V CW marker at 2134. (Dix, NY)
- 8570.0 XVT/5-Danang Radio, Vietnam, with CQ CW marker at 1224 (Dix, NY)
- 8573.5 HSA2/4-Bangkok Radio, Thailand, heard with a CQ CW marker at 1156. (Dix, NY)
- 8577.0 HLO-Seoul Radio, South Korea, sending a CQ CW marker at 0854. (Dix, NY)
- 8596.0 RIT-Moscow Naval Radio, USSR, at 1159 with a V CW marker. (Dix, NY)
- 8604.0 DZJ-Manila (Bulacan) Radio heard at 1336 with a CQ CW marker. (Dix, NY)
- 8636.0 HLW-Seoul Radio, South Korea, with a CQ CW marker at 1229. (Dix, NY)
- 8652.5 PZN-Paramaribo Radio, Surinam, with a CQ CW marker at 2050. (Dix, NY)
- 8686.0 PKF-Makassar Radio, Indonesia, heard at 1213 with a CQ CW marker. (Dix, NY)
- 8690.0 6VA-Dakar Radio, Senegal, sending a CQ CW marker at 2149. (Dix, NY)
XFS2-C. Madero Radio, Mexico, heard with a hand sent DE CW marker at 1406. (Dix, NY)
- 8742.0 TEC-Puntarenas (Ocean) Radio, Costa Rica, with a CQ CW marker at 2312. (Dix, NY)
- 8959.0 Sabre 750 Charlie Charlie calling New York ARINC in USB at 1428. (Battles, NH)
- 8960.0 Portishead Radio (UK) working 372046 in USB at 0218. (Battles, NH)
- 8967.0 VAN 41 Military calling Yokota (GCCS) AFB, Japan, in USB at 0027. (Battles, NH)
- 8972.0 Hawaiian 837 working Shanwick ATC with a phone patch (covered by USN units) in USB at 2126. (Battles, NH)
- 9006.0 Bearcat 01 working Halifax Military with an operations message in ISB at 2010. (Battles, NH)
- 9060.0 RCU73-Novosibirsk Meteo, USSR, sending FAX (120/576) weather maps with a good signal at 2100. (Sundstrom, NJ)
- 9210.0 An unidentified station sending RTTY (400/50N) RYs and QBFs and no ID through 1940. (Sundstrom, NJ)
- 10179.6 An unidentified station sending continuous five number groups with a strong signal at 1945 in CW. (Sundstrom, NJ)
- 10720.0 LR872-Buenos Aires, Argentina, at 2250 with FAX (120/576) weather maps parallel 5185, 18093. (Sundstrom, NJ)
- 10960.3 Unknown station using SITOR-A repeats "NZ" or "NNZ" or "NXZ" through 0130. (Sundstrom, NJ)
- 11056.0 Recon Cell called 2 Kilo several times in USB at 2215 then went DVP scrambled. (Battles, NH)
- 11073.5 Slingshot working Checker 46 with track information for "target" in USB at 1529. (DEA) (Battles, NH) Those are Customs calls, Bill. -ed.
- 11142.0 KRH50-U.S. Embassy, London, England, sending CW QSX marker at 1824. (Sundstrom, NJ)
- 11205.0 Halifax Military calling CANFORCE 105 in USB at 1607. (Battles, NH)
- 11233.0 Lahr Military working Trenton Military in USB at 1916. (Battles, NH)
- 11234.0 7 Foxtrot Mike working Gibraltar (RAF) in USB at 2017. (Battles, NH)
- 11249.0 Halifax Military with an EAM broadcast in USB at 2001. (Battles, NH) While I know they have been listed here before, I find this an odd mix of Canadian mil on a USAF GCCS channel, just thinking out loud again. -ed.
- 11312.0 Tactical net "Crossbow and Green 3 Truck" in communications, then they all moved to frequency "X-ray Zero" in USB at 1732. (Battles, NH)
- 11401.0 NNNOMET working NNNOMOQ (USN MARS channel) with phone patch traffic in USB at 1433. (Battles, NH) Those are both Marine MARS stations, Bill. -ed.
- 11541.0 7OC-Khormaksar Aero, Aden, South Yemen, sending RTTY (400/50N) RYs "RQ QRK IMI TKS DE 70C" then traffic at 1750. (Sundstrom, NJ)
- 11638.0 DDK8-Hamburg Meteo, West Germany, at 1730 with RTTY (400/50N) coded weather then at 1746 RYs adn CQ tape. (Sundstrom, NJ)
- 12035.0 NAM-U.S. Naval Radio, Norfolk, Virginia, in CW at 2220 with extensive weather forecast broadcast. (Sundstrom, NJ)
- 12675.0 A4M-Muscat Radio, Oman, with a DE CW marker at 1237. (Dix, NY)
- 12690.0 ZAD2-Durres Radio, Albania, heard at 1117 in CW with a V marker. (Dix, NY)
- 12697.0 UBN-Jdanov Radio, USSR, at 1101 with a V CW marker. (Dix, NY)
- 12709.2 9HD-Malta Radio, Malta, heard at 1306 using a V CW marker. (Dix, NY)

- 12712.0 HLW3-Seoul Radio, South Korea, at 2004 with a CW CQ marker. (Dix, NY)
- 12799.0 PKC-Palembang Radio, Indonesia, sending a CQ CW marker at 1247. (Dix, NY)
- 12799.5 PCH510 Scheveningen Radio, Holland, heard at 0226 with a DE marker. (Sundstrom, NJ)
- 12836.0 CCS-Santiago Naval Radio, Chile, at 1932 with a V CW marker. (Dix, NY)
- 12840.0 VTP-Vishakhapatnam Radio, India, heard at 1239 with a V CW marker. (Dix, NY)
- 12867.0 NRV/NPO-U.S. Naval Radio, Guam/Honolulu, heard at 0020 with a V CW marker. (Dix, NY)
- 12870.0 DZO-Manila (Bulacan) Radio, Philippines, at 1353 with a CQ CW marker. (Dix, NY)
- 12886.5 WLO-Mobile Radio, Alabama, sending in CW a full transmission schedule. Parallel other WLO frequencies. (Sundstrom, NJ)
- 12900.5 XFF-Coatzacoalcos Radio, Mexico, heard at 2054 with a CQ CW marker. (Dix, NY)
- 12969.0 XSV-Tianjin Radio, PRC, at 1154 with a CW CQ marker. (Dix, NY)
- 13057.0 LSA-Boca Radio, Argentina, monitored at 0149 with a V CW marker -- hand sent. (Dix, NY)
- 13065.0 6YI-Kingston Radio, Jamaica, heard at 1240 with a CQ CW marker. (Dix, NY)
- 13069.5 TFA-Reykjavik Radio, Iceland, at 1329 sending a CQ CW marker. (Dix, NY)
- 13201.0 SAC Maintenance radio calling Elemendorf GCCS in USB at 1933 for a radio check. (Battles, NH)
- 13204.0 Bangor Control working Warship and several other units with war games traffic in USB at 2002. (Battles, NH)
- 13248.0 German Air Force 714 working DHM-91 in USB at 1910. Went to frequency "Whiskey" (17992) at 1912. (Battles, NH)
- 13286.0 WARDAIR Toronto operations working WADAIR 115 in USB at 2055. (Battles, NH)
- 13291.0 Concorde 4 (SST) working New York ARINC in USB at 1924. (Battles, NH)
- 13297.0 Speedbird 259 (British Airways) working New York ARINC in USB at 1953. (Battles, NH)
- 13330.0 Houston ATC working Southern Air 911 (aircraft was near Salt Lake) in USB at 1931. (Battles, NH)
- 13407.0 Unknown stations using digital scrambled voice comms in USB at 1354. (Battles, NH)
- 13420.0 CUA69-Lisbon (Alfragide) Radio, Portugal, broadcasting telegrams to ships in CW. (Dix, NY)
- 13524.0 YIO72-INA Baghdad, Iraq, at 1450 with a RTTY (425/50N) English news 1500-1530 parallel 14373.0. (Sundstrom, NJ)
- 14373.0 YIL23-INA Baghdad, Iraq, at 1450 with a RTTY (425/50N) English news 1500-1530 parallel 13524.0. (Sundstrom, NJ)
- 14574.4 CNM59/X9-MAP Rabat, Morocco, sending English RTTY (425/50N) news. Parallel 15999.9, 15752.8, 16134.1, and two more at 1205. (Sundstrom, NJ)
- 14605.0 Y7K30-MFA Berlin, GDR, with RTTY (170/50R) RYs at 1321. (Sundstrom, NJ)
- 14760.0 CNM61-MAP Rabat, Morocco, sending English RTTY (425/50N) news. Parallel 15999.9, 15752.8, 16134.1 and two more at 1205. (Sundstrom, NJ)
- 14912.5 DFZG-MFA Belgrade, Yugoslavia, sending RTTY (425/75R) news in an unknown language at 1540. (Sundstrom, NJ)
- 15575.0 REN30-TASS Moscow, USSR, with a 1250 sign-on of their English news bulletins sent via RTTY (425/50N). (Sundstrom, NJ)
- 15647.1 PCW1-MFA Den Haag, Holland, with CW ID and ARQ phasing signal at 0120 - new frequency? (Sundstrom, NJ)
- 15752.8 CNM66/X2-MAP Rabat, Morocco, sending English RTTY (425/50N) news at 1205. Parallel 15999.9, 14574.4, 18220.9, and two more. (Sundstrom, NJ)
- 15830.0 RUZU-Antarctica sending coded RTTY (500/50N) traffic, also FAX weather maps. (Sundstrom, NJ)
- 16117.0 YVK317-PANA Dakar, Senegal, sending a mixture of French and English RTTY (425/50N) news through 1450. (Sundstrom, NJ)
- 16136.0 BZR66-XINHUA Beijing, PRC, sending English RTTY (425/50N) news at 1150. Also noted 385/75N. (Sundstrom, NJ)
- 16178.5 Monitored an unidentified station sending five letter groups using



South African Airways QSL from Jacques Ahouansou of Abidjan

- RTTY (260/80R) until 1200. Then noted they sent a hand sent "OK" in CW then open carrier. (Sundstrom, NJ)
- 16265.0 Noted an unidentified SITOR-A Idler here at 1120. No traffic heard sent through 1220 tuneout. (Sundstrom, NJ)
- 16325.0 Y2V23-ADN Berlin, East Germany, with English news via RTTY (375/50R) at 1430. (Sundstrom, NJ)
- 16343.0 YZ14-Tanjug Belgrade, Yugoslavia, with French news bulletins in RTTY (425/75N0 at 1400. (Sundstrom, NJ)
- 16397.5 FTQ39-French DIPLO Paris, France, heard at 1710 with RTTY (400/50N) French news. (Sundstrom, NJ)
- 16687.0 HCRE-Ecuadorian registered MV Republic del Ecuador sending SITOR-A to Panabana/NY at 2046. (Sundstrom, NJ)
- 16912.0 SUH-Alexandria Radio, Egypt, at 1251 with a V CW marker. (Dix, NY)
- 16985.0 HKMR de KOAT with a CW marker (unknown). (Dix, NY) Probably a couple of ships, Jack. -ed.
- 18019.0 Camp LeJeune (The Marines -ed.) calling MacDill (GCCS) AFB, Florida, for a radio check. (Battles, NH)
- 18161.0 RBI78-TASS Moscow, USSR, sending RTTY (425/50R) RYs then abruptly dropped carrier at 1546. (Sundstrom, NJ)
- 18220.9 CNM71/X9-MAP Rabat, Morocco, sending English RTTY (425/50N) news at 1205. Parallel 14574.4, 14760.0, 15752.8 and two more. (Sundstrom, NJ)
- 18230.5 GFL25-Bracknell Meteo, England, with RTTY (425/50N) coded weather bulletins. (Sundstrom, NJ)
- 20185.7 One side of a duplex phone patch frequency with information about angles of boresight tower settings in USB at 1804 (I believe this is a NASA frequency. (Battles, NH) Yes, Bill, this originates from Ascension Island and is a part of the air force MUX channel here that carries NASA traffic. -ed.
- 20350.0 NBA-U.S. Navy Balboa, Panama, sending an RTTY marker (850/75N0 and RYs at 1335. (Sundstrom, NJ)
- 20994.0 U.S. Army European MARS net in communications with traffic at 1830 in USB. (Battles, NH)
- 22440.0 Unidentified station sending FAX (60/576) signals at 1250. Poor signals. (Sundstrom, NJ)
- 22443.0 OST-Oostende Radio, Belgium, at 1203 with CW ID and ARQ phasing signal. (Sundstrom, NJ)
- 22443.7 YUR9-Rijeka Radio, Yugoslavia, sending CW V marker adn traffic at 1210. (Sundstrom, NJ)
- 22446.0 EAD6-Aranjuez Radio, Spain, with a DE CW marker at 1247. (Sundstrom, NJ)
- 22448.0 YQI7-Constanta Radio, Romania, heard at 1243 with a DE CW marker. (Sundstrom, NJ)
- 22448.7 GKB7-Portsmouth Radio, England, sending a DE CW tape of all calls at 1235. (Sundstrom, NJ)
- 22450.0 ROT-Moscow Naval Radio, USSR, at 1229 with a CQ CW marker. (Sundstrom, NJ)
- 22471.5 SVD7-Athens Radio, Greece, with traffic, then DE CW marker at 1220. (Sundstrom, NJ)
- 22476.0 DAM-Norddeich Radio, West Germany, at 1223 with a V CW marker. (Sundstrom, NJ)
- 22487.0 WLO-Mobile Radio, Alabama, sending a weather transmission schedule at 2020 in CW. At 2040 sending a traffic list using SITOR-B. (Sundstrom, NJ)
- 25130.5 LPD34-General Pacheo Radio, Buenos Aires, Argentina, at 1225 with a CW V marker. (Sundstrom, NJ)

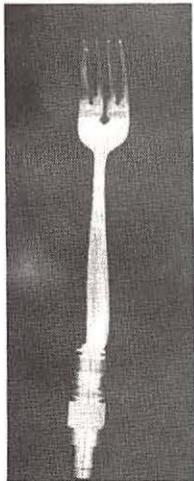
The Scanning Report

Bob Kay

P.O. Box 173

Prospect Park, PA 19076

Understanding Antennas



Is it a fork or UHF antenna?

The answer is here in the Scanning Report.

Before you begin reading this column, grab a cup of coffee. After the cream and/or sugar is added, hold onto the spoon. If you prefer black coffee, bring a fork or butter knife back to your favorite chair and relax.

Now simply hold that metal utensil vertically between your fingers. Examine it closely and try to imagine that you're holding an antenna. Sound ridiculous? It's

not. If you are holding a knife, fork, or spoon, that utensil is receiving radio signals from all directions. Because of its size, signals from the upper end of the UHF T band and lower end of the 800 megahertz band are being randomly captured.

Still not convinced? Think about it for a moment. Is the utensil you are holding much different from a single element ground plane antenna? For simplicity, let's say you are holding a fork. If we silver braze a connector to one end and then feed it to our scanner with a length of coax, would it receive UHF and cellular signals? You're darn right it would!

Look around the room where you are sitting. Is there a metal lamp in the corner? If so, it's receiving radio signals as well. The metal pen in your pocket, the coat hangers in the closet, and the curtain rods over the window are all capturing radio signals.

The point I'm trying to make is that radio signals are attracted to metal objects -- all metal objects. The scanning enthusiast and would-be antenna builder often fails to realize that radio signals have no ego. A hunk of sewer pipe, if properly prepared, can be used as a scanner antenna; the radio signals will never know the difference.

Antennas are made from aluminum tubing because the material is lightweight, easily handled, and corrosion resistant. Antennas are also made to be appealing to the eye. That's why commercially produced scanning antennas are not fabricated from used copper pipe or discarded TV antennas.

Since I'm tearing down old myths, here's the most difficult one to accept: The performance of a solid copper antenna would equal the performance of an identical antenna made from scrap iron. Sure, the iron antenna would require some special attention to prevent rust at the connection points, but signal capturing ability would not be enhanced by the mere use of copper.

Since copper is a good conductor of electricity, most of us incorrectly believe that copper will also be a better conductor of airborne radio signals. As I've already mentioned, radio signals cannot be influenced by the type of metal being utilized.

In receiving antennas, the diameter of the tubing is not critical. Now before all you technical types start screaming and writing nasty letters, please hear me out. Sure, two identical lengths of tubing, with different diameters will not perform exactly alike. The larger diameter tube or pipe would resonate on a lower frequency. But who wants to get that technical? Relax a little. We're scanner buffs -- not design engineers. Simply use small diameter tubing that can easily be handled. Again, it can be steel, aluminum, copper, or even an old piece of electrical conduit.

If your scanning madness includes the VHF low and high bands, consider using a horizontal wire antenna. This type of antenna is commonly used by ham and shortwave listeners. Generally, the wire is hung between two supporting posts and fed with a length of coax. Cosmetic appeal is also evident in this type of antenna. Although steel barbed wire could be used, it probably won't appear on roof tops unless cows start to fly.

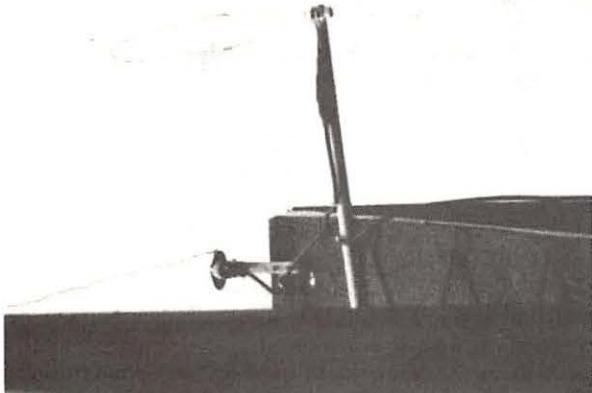
Is there an old spool of rubber or plastic coated wire in your basement? If so, don't be afraid to transform it into a scanning antenna. The coating will not affect the ability of the wire to receive radio signals. Don't overlook lamp cord, rotor cable, and 300 ohm twin lead TV wire as possible construction substitutes for building a wire antenna.

Although antennas can be constructed from a wide variety of materials, there is a snafu that can ruin your project. When selecting materials, remember that steel and aluminum cannot be connected together. A chemical reaction will take place and eventually ruin the antenna's performance. Likewise, don't connect aluminum tubing with steel hardware. Use good quality brass, stainless, or aluminum nuts and bolts.

Both old and new television antennas can be modified to receive the scanner bands. A scanning beam, similar to the one offered by Grove, can be made by cutting the elements of a standard UHF/VHF television antenna and mounting it vertically.

Don't be confused by the terms vertical and horizontal polarization. Television signals are transmitted horizontally. Radio signals are transmitted vertically. Scanner antennas are mounted vertically for two reasons: 1. Vertical mounting enhances radio reception by orienting the antenna to the signal, 2. Vertical polarization helps to null the antenna's ability to capture unwanted TV signals.

For the military aircraft and cellular frequencies, I personally use a modified, vertically mounted UHF bow tie antenna. The bow tie antenna is available from Radio Shack for under two bucks. Both sides of the antenna are cut and fitted with extensions made from coat hangers! The entire process takes about twenty minutes and the performance of this nifty little antenna is outstanding.



This home-brewed extended UHF bow tie antenna rivals the performance of professionally manufactured discones.

Like to paint? Painting a home brew scanning antenna to match the color of your home will not affect its performance. Paint, even in multiple layers, cannot stop radio signals.

Building your own scanning antennas is a good way to save money and have a lot of fun. In less than 45 minutes, you can make a scanner beam, a long-wire low band antenna, and the 225-800 megahertz bow tie antenna for under thirty dollars. If you already have a discarded TV antenna and some miscellaneous hardware laying around, your total cost could be under ten bucks.

Be sure to check out Clem Small's column this month. There's plans for what he calls a "lop eared rabbit" antenna. The antenna gets its name from the fact that you build it out of old TV rabbit ears. So get going. Get scrounging. And get building.

MT Treasure Hunt

There's real treasure to be found here, mate! Naval Electronics has provided two HTS-1 amplified speakers as prizes. The speakers are portable, internally powered by four AA batteries, and they shut down automatically when there isn't a transmission taking place.

Having difficulty hearing your hand-held in the car? The HTS-1 will easily raise your scanner's volume above road noise and above the comfortable setting of your FM stereo.

Interested? Here are the clues:

1. Look at the March 1989 cover of *MT*. What is the marital status of the gentleman sitting at the console?
2. What is his name?
3. List his job title in three words.
4. What is he writing?
5. Grab the January 1989 issue; find the page number that featured the HTS-1.
6. Go back to the March 1989 issue. Turn to the page number that you discovered in clue #5. What is the title of the column on that page?

During this treasure hunt, remember that there can only be two winners. Don't send an SASE. Both winners will be selected by a random drawing. Send your answers to: Treasure Hunt, c/o Monitoring Times, P.O. Box 98, Brasstown, NC 28902.

Next month I'll announce the two winners along with a new treasure hunt and prizes.

Frequency Exchange

In Northern California, Steve Hada has been hearing communications on 163.975 and 167.275. Steve lives near Davis, California, and he asked if anyone can confirm the agency that uses these two frequencies.

Moving further north, John Wunderlich sent in the following frequencies for the Washington State Patrol: 453.35, 154.845, 158.97, 154.755, 153.785. John lives in Seattle and would appreciate swapping frequencies with other scanning buffs.

In the warmer air of San Antonio, Texas, Barney Hamlin has been monitoring the military. At Fort Sam Houston, Barney listens to army helicopters on 30.510, 36.710, and 41.50. Barney also supplied a list of frequencies for the U.S. Air Force Military Police at Randolph, Lackland, and Kelly: 163.125, 163.460, 163.540, 163.560, 163.590, 164.990, 165.190, 166.10, 170.60, 172.150, 410.025, 413.00.

Since Texas is such a big state, let's try another logging sent in by Mr. C. Cartwright. Here's the updated frequencies for the Corpus Christi Police: 481.925, 481.850, 481.875, 481.800, 481.975.

Doctor Stanley Glass has been monitoring the Florida Highway Patrol from his residence in Miami. Here is his listing for the Turnpike: 453.575, 453.625, 453.675, 453.725.

Doctor Glass also reports that he found 154.920 to be the "Bear in the Air" frequency. The FHP uses a Cessna 172 to spot speeding motorists from the sky. According to a newspaper clipping submitted by Doctor Glass, the Bear in the Air catches about 25 speeding motorists per hour!

Since Doctor Glass still makes house calls, there's no doubt that he regularly listens to the Bear in the Air frequency. But don't expect him to come running if you're sick. The doctor refuses to treat *MT* readers -- he is a veterinarian.

Traveling north along the coast, let's check in with Bob Murphy. Bob offers the following frequencies for the submarine base at Groton, Connecticut: 140.850-shore patrol, 149.375-miscellaneous/portables.

Bob also found Sikorsky Helicopter test flights on 275.2, 383.4, 123.550, 34.900, and 46.700.

According to Bob, the following Fleet SATCOM frequencies are also active in his area: 261.65 voice phone patches, 261.5, 262.550, 261.475, 263.700, and 249.550. Bob points out that these SATCOM frequencies are in narrow band FM.

To wrap up this month's Frequency Exchange, Mike Dillon of Louisville, Nebraska, invites everyone to come west again. Mike provided the following list of frequencies for the Offutt Air Force Base:

Offutt Air Force Base Frequency List

40.170 Air Force Office of Special Investigations (AFOSI)
 40.190 AFOSI
 49.70 Explosives Ordnance Disposal (EOD)
 121.70 Ground Control
 123.70 Tower
 130.650 Military Airlift Command (MAC)
 135.350 Offutt GCA Approach
 138.325 Offutt Pagers
 140.40 First Airborne Command and Control Squadron (1ACCS)
 142.125 IBR Network
 143.460 Air Force MARS
 143.825 National Emergency Airborne Command Post (NECAP) Alert
 148.035 55th Strategic Reconnaissance wing Command and Control Network (SRW CG NET)
 148.150 Civil Air Patrol
 149.050 Ramp Control
 149.235 Transportation Dispatch
 149.50 Wing Commander's Network
 150.025 Motor Pool
 150.195 Medical Network
 150.285 Fire and Crash Network
 154.010 Fire Network
 163.056 Offutt Civil Engineering
 163.315 Disaster Control
 163.485 Security Police
 163.510 Law Enforcement
 163.560 Mobile Controller
 173.385 Fire and Crash
 173.585 Fire and Crash units
 236.60 Tower
 255.40 Flight Weather
 257.80 Ground Control
 273.50 Automatic Terminal Information Service (ATIS)
 275.80 Ground Control -- AM
 311.0 SAC Command Post (Primary)
 312.0 SAC Command Post (Secondary)
 342.50 Pilot to Metro

348.40	Tower
372.20	Pilot to Dispatch
413.20	Base Operations Network (FM)
413.30	Snow Control Network (FM)
413.150	Field Maintenance (FM)

Computing Help for the FRG-9600

In April's column, John Fickewirth asked for IBM control software for his newly purchased FRG-9600 receiver. Robert L. DeArmond, Jr. responded by sending along a brochure from Applied Solutions. Robert indicated that he was very satisfied with the increased scanning speed and automatic logging of frequencies offered by Applied Solutions software. For more information, write to Applied Solutions, P.O. Box 188, Garden Grove, California 92640.

Another software package for the FRG-9600 is being offered by Don Rasmussen. Don offers his program as Shareware. This simply means that the program is offered at no cost. If you decide the program is useful, keep it and send Don whatever you think it is worth.

For more information, Don can be reached at 2316-241 Paseao De Laura, Oceanside, California 92056. Be sure to include an SASE.

Riding and Scanning the Rails

Dave Randall just made a round trip on Amtrack between Connecticut and Washington D.C. Since Dave didn't have a hand-held scanner, he took along his PRO 2004. To power the scanner radio, he used a VCR battery, which only lasted about two and one-half hours.

Not wanting to miss any of the action, Dave decided to look around for a wall plug. Near a window seat in the Club Car, he found a common 115 volt outlet. Dave immediately sat down, placed his scanner on the eating tray and plugged in. How's that for American ingenuity?

Cordless Phone Antenna

A few years back, a company called Valor made a rooftop cordless phone antenna. It was a simple ground plane, fed by coax. Brad Swain of Caleton, Missouri, wrote in to ask if this antenna could be used for scanning.

From Brad's description, the antenna is a single element ground plane, specifically cut to resonate on cordless frequencies. As such, it would certainly pull in all VHF low and high band signals and could possibly display some "gain" on these bands. However, performance on the higher frequencies would be compromised and gain would not be possible.

Forks and Roofs

If anyone spots a house with eating utensils mounted on the roof, especially forks, that's my place! Stop in and say hello, but don't tell my wife -- she hasn't realized that a few pieces of her silverware are missing. I just hope that I didn't use any of her grandmother's antique silverware. Heck, it all looked the same to me!

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Sammy the Scanner



Courtesy of Northeast Scanning News

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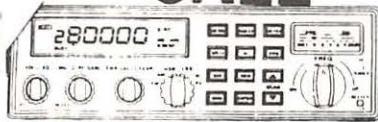
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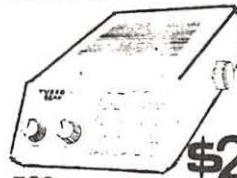
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	BC-760XLT	100ch,29-54,118-174,406-512,806-952MHz.....	269
	BC-600XLT	100ch,29-54,118-174,406-512,Priority,Search.....	214.00
	BC-800XLT	40ch,29-54,118-174,406-512,806-912MHz.....	259.00
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UNIDEN CHANGES BC760XLT MICROPROCESSOR

The popular Uniden BC760XLT mobile scanner has undergone some subtle surgery. 1988 models (code date ending "HH") were capable of receiving tone-encoded signals with the tone decoder board installed and switched on, but they could not receive normal unencoded signals at the same time. Those sets could also hear cellular frequencies by merely cutting pin 20 on the microprocessor IC.

All units manufactured after the first of the year (code date ending in "HI") can now allow simultaneous reception of tone-encoded and non-tone-encoded channels, but snipping pin 20 won't restore cellular coverage!

Since Uniden has provided for instant switchover to cellular-capability in their scanner assembly line if it is in their best interest, there is probably a way to do it in the new model. MT will let you know when we figure out how!

(Ed. note: While MT does not condone the uninvited monitoring of communications protected under the provisions of ECPA '86, some frequency ranges are used for both protected and unprotected communications. We offer information on restoring full frequency coverage to those who use their receiving capability with discretion.)

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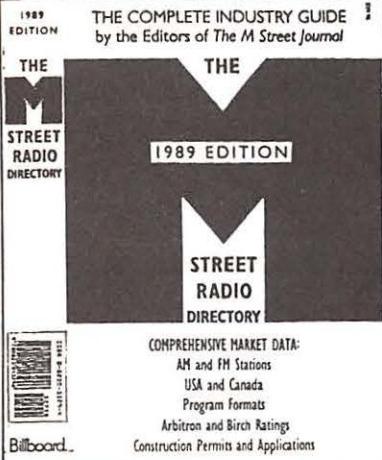


what's new?

The M Street Radio Directory

Readers interested in last month's review of the *Broadcasting Yearbook* but intimidated by its price (\$110.00) now have an alternative at a price they can afford: *The M Street Radio Directory*.

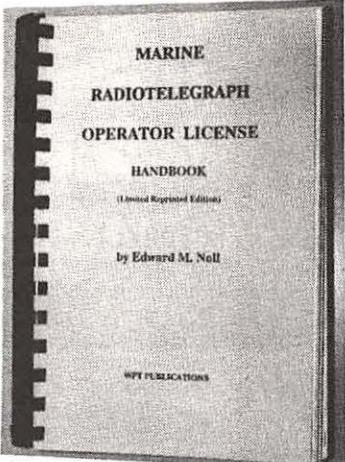
The M Street Radio Directory contains over 600 pages of up-to-date information on domestic US AM and FM radio, much



in the style of the *Broadcasting Yearbook*.

There are six sections. First, stations are arranged by state and city. Each station entry contains call sign, technical information, format, address and phone number, market(s) served, Birch and Arbitron ratings and more. Stations are also cross-referenced by call letter and frequency — perfect for DXers. Additional sections include market listings by frequency (dial cards), Canadian stations by province and city and finally, pending AM and FM broadcast applications.

The premier edition of the *M Street Radio Directory* is \$29.95 plus \$2.70 shipping, handling and insurance from DX Radio Supply, P.O. Box 360, Wagontown, PA 19376. All Pennsylvania residents add \$1.80 sales tax.



Radio Telegraph License Exam

A limited complete reprint of Ed Noll's "Marine Radiotelegraph Operator License Handbook (1975)" has been published by WPT Publications. Of particular

EMUF is EMUF!

EMUF 2+ for the Macintosh computer is a highly user-interactive program used to predict shortwave propagation conditions between any two points on the globe. The program uses Kjell Strom's algorithms for propagation prediction. These produce fairly accurate information about which frequencies will work best at given times under given solar conditions.

Upon startup, the user inputs information about transmitter location, receiver location, solar conditions, and the date and time. The highly intuitive program reads in date and time info from the computer's memory though the user can change it if desired) and registered users can have the receiver location encoded in the memory. Thus, the user then only has to enter the solar flux/sunspot number and the transmitter location.

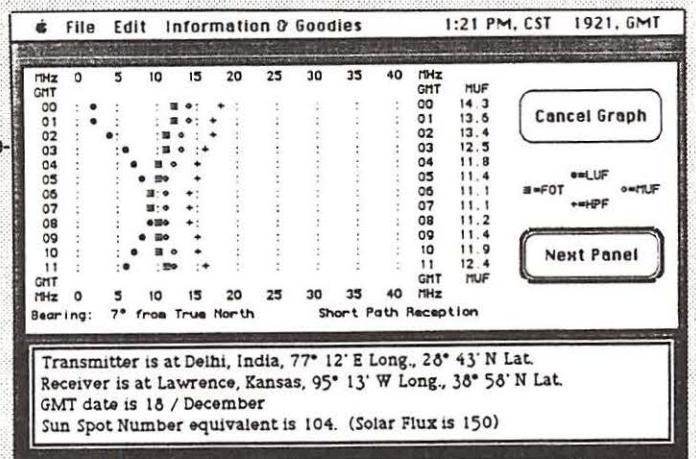
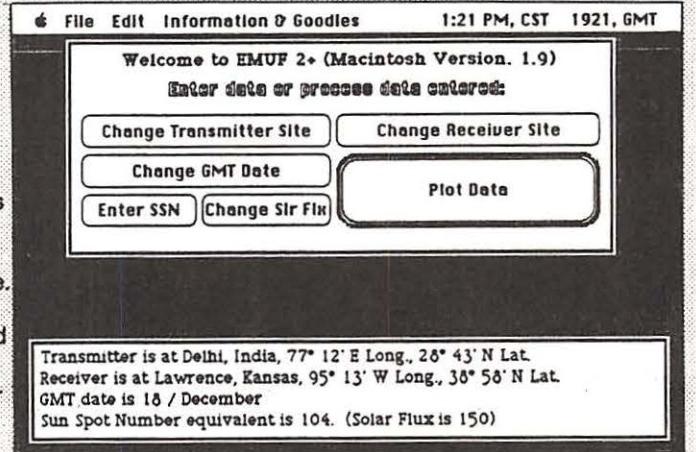
"EMUF"'s creator, Kenneth Vito Zichi, has stored around 40 transmitter sites on the "EMUF" disk. These can be loaded into the program, thus eliminating the tedious task of looking up the station's latitude and longitude in an atlas or the *World Radio TV Handbook*.

After all the information is ready to go, the program produces a graph or chart of propagation details over the next 24 hours, including optimum frequency, maximum and minimum useable frequencies, and highest possible frequency. (The importance of these are explained in the manual, which is included with the disk.)

The program includes on-line help and a handy clock, located on the menu bar, which includes the time in both local time and UTC.

This excellent program is sold on the "shareware" system, which means that users can try it before they buy it. To obtain a copy, Macintosh users should send a disk and a 45 cent self-addressed, stamped envelope to Kenneth Vito Zichi, 3018 Moyer Road, Williamston, Michigan 48895. For more information on the program, send an SASE to the same address.

--Kannan Shanmugam



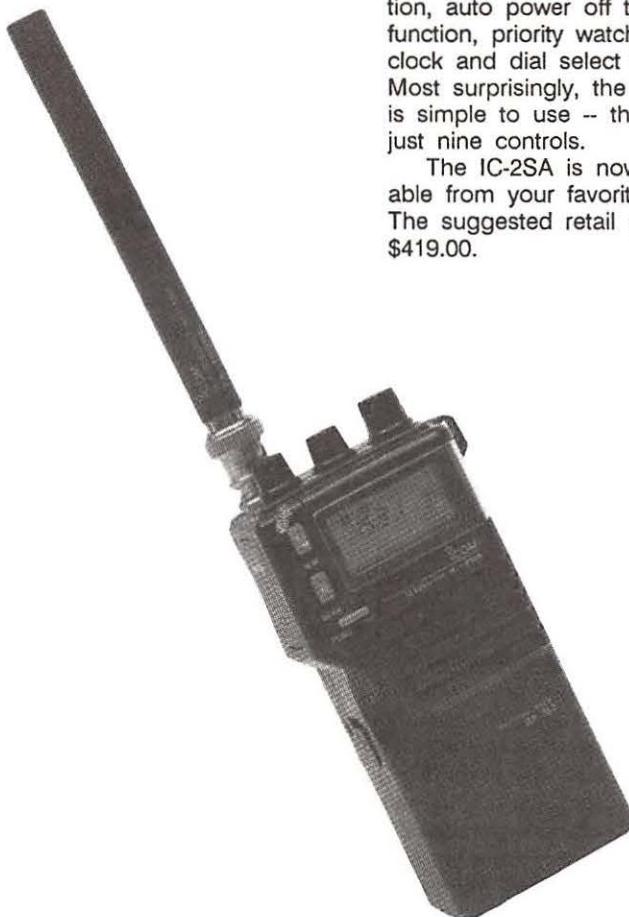
help in preparing for the FCC Radiotelegraph Exam are the nine chapters that detail the technical information related to Element 6 of the FCC test. Radar Element 8 is also included.

For more information, contact WPT, Reprint Department, 979 Young Street, Suite A, Woodburn, Oregon 97071.

ICOM SAYS "Let's Get Small!"

ICOM has announced the debut of a "micro-sized" handheld transceiver. Dubbed the IC-2SA, the multi-function two-meter unit is so small it fits in the palm of your hand -- without compromising features.

Packed into this amazingly small radio is five watt power output, 48 memory channels, multi-scanning func-



tion, auto power off timer function, priority watch, built-in clock and dial select function. Most surprisingly, the IC-2SA is simple to use -- there are just nine controls.

The IC-2SA is now available from your favorite dealer. The suggested retail price is \$419.00.

In a previous edition, *Monitoring Times* incorrectly listed the address of Azimuth Communications. Their new address is 11845 West Olympic Boulevard, Suite 1100, Los Angeles, California 90064. For more information, call 1-800-882-7388.

To have your new product or book considered for review in *Monitoring Times*, send it to Editor, 140 Dog Branch Road, Brasstown, NC 28902.



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MT

Uncle Skip Foils Interference

One of the rights of passage into the "real world" in the good old U.S. of A. is the purchase of a single family dwelling. Personally, I didn't bring the idea up. My spouse decided it was time to go house hunting.

I remained my stoic self; as long as the place had a basement and two widely spaced trees, I could ply my radio talents. So began a series of trips led by salivating real estate agents through properties big, small, and mostly out of budget.

Well, as it goes, my "significant other's" eyes fell upon an abode that she loved from the moment she saw the For Sale sign in the front yard. Heck, the price was right and nothing was broken that I couldn't fix.

This is going somewhere, isn't it, Uncle Skip?

Dusk was settling in as my wife and our agent began talking turkey on the sale terms. I stood in the front yard reconnoitering the property for escape routes and free fire zones.

Then I saw it...off in the distance, about half a klick, a red flashing light on top of a tower. I began to get this slow, sinking feeling as I ran a string of AM radio station coverage maps through my head. *My one and only ever-loving wife's dream house is within spitting distance of a 50 kW clear channel AM radio station!!!* I began to sweat as I thought of picking up the local sports broadcasts over my kitchen toaster.

I was stuck. Number one son was already making friends with the locals. My wife was getting that "nesting" look in her eyes. Old Uncle Skip was going to be forced to do battle with interference and overload. It was either that or trade all the rigs in on golf clubs.

In other words, this looks like a lead-in for...

Uncle Skip's Guide to Foiling Interference

The first project was to figure out how to limit the damage from the local radio station. For the shortwave listener, this means dealing with unwanted signals entering the receiver.

First, go over your radios and make sure there are no corroded connections or solder joints. Any oxidation between dissimilar metals can lead to rectification. Simply put, a cold solder joint can act as a crystal set and drag that local signal into your receiver. When closing up the case after examination, make sure all case and chassis screws are tight to keep good ground and shielding connections.

As Uncle Skip always recommends, don't go monkeying around inside your radio unless you know what you are doing or you have someone who does teaching you.

Next, it is helpful to give some thought to harmonics, first at the antenna input and then at the IF stage. Some problems caused by harmonics can be eliminated, but some you'll have to live with.

Let's say your local broadcaster operates on 1500 kHz. You may hear harmonics on 3000 kHz, 4500 kHz, even 6000 kHz, putting your local station's signal all the way into the 49 meter shortwave band. Not a happy prospect.

Tuning your antenna with a device such as the Grove Minituner will clean up all but the "worst possible case" images produced by your nearby broadcaster.

Now many of you know Old Uncle Skip enjoys AM broadcast band DXing. How does one manage this against strong locals?

To be honest, you just have to accept that you are going to miss stuff under the local and most things within 20 kHz are going to be a bear. I just tough it out and enjoy the rest of the band. I also call the

station engineer and ask when the transmitter will go off line for routine maintenance. Also, serious BCB DXing tends to take advantage of preamplified loop antennas.

You can still use such equipment, but you are going to run into overloading. Needless to say, preamplifiers, amplified preselectors, and most amplified antenna designs are going to suffer in the presence of a strong local signal.

So let's say you have taken the sage advice given in the above paragraphs. In some cases you are still not out of the woods. It is possible for that strong local signal to leak into the IF stage of your receiver. This can cause images in unusual places on the band due to the signal mixing going on inside your set.

So before you get all excited and try to QSL Radio Nibi Nibi on some frequency never before logged, you might want to check things out in Glen Hauser's or Larry Van Horn's column. You might be in the

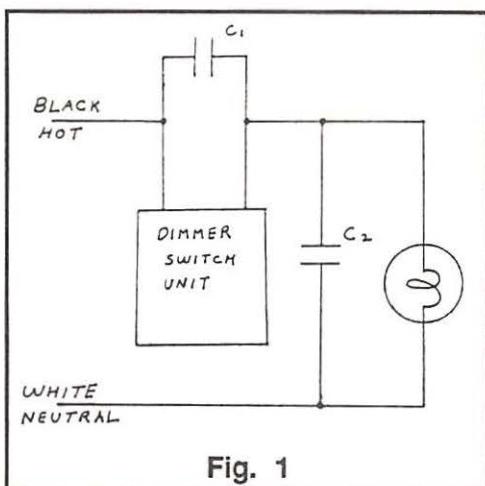


Fig. 1

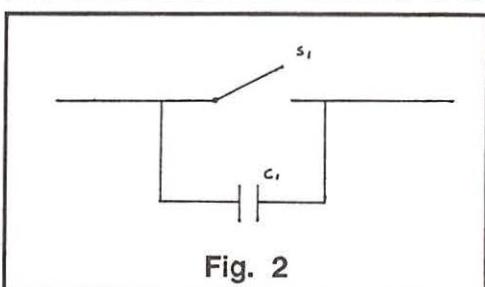


Fig. 2

right church but sitting in the wrong pew! Images have resulted in a lot of embarrassment to newcomers to our hobby. Old Uncle Skip even got bit once, thinking he had found a new AFRTS outlet back in 1975. Boy, was my face red.

I've picked on broadcasters quite a bit up to this point. Another culprit could be (dare I say it?) your local Amateur Radio Operator.

Fear not. Hams are very concerned with keeping their signals out of places where they don't belong. Just stop by his or her shack and tell that ham what you are up against. That local Amateur Op will get you squared away and show you a thing or two about the radio hobby as well.

If, by chance, you run across that one ham in a thousand who doesn't want to discuss the problems with his signal, your F.C.C. field office can put you in touch with area amateurs who respond to interference complaints.

So now that I have shown you how to whittle down 50 thousand watts to a manageable level, you would think that Old Uncle Skip would be DXing with ease.

This was not the case. Upon moving into our dream house, I discovered two additional interference problems.

First, the dining room had a dimmer switch installed. You know, one of those things for lowering the lights to a romantic glow whilst mulling over the meatloaf. It can make a racket that will wake the dead on all HF bands.

The second hassle involved an annoying click from the thermostat switch. Nothing worse than digging out a weak signal with earphones, only to have your head jarred loose by a loud pop as the furnace kicked in on a cold winter night.

Both problems responded quite nicely to the application of judiciously placed .01 mfd 2 kV disk ceramic capacitors (Radio Shack part number 272-160). Figure 1 demonstrates how to attack an offending dimmer switch. Most modern dimmer switches are of the SCR type and are made interference free by this method.

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Figure 2 shows how to connect a capacitor to eliminate the noise from any switching device such as a thermostat, aquarium heater, toaster, or those wacky Christmas tree lights.

Before trying any modifications of the above two types, be absolutely sure you are not violating any local electrical codes. Failure to look into this could void your fire insurance. You may need to secure the support of a licensed electrician to keep things all legal and on the up and up.

Also, when doing "capacitor bypass surgery," work very carefully. Always pull the line fuse or trip the circuit breaker. Make sure you do not short out the line, or worse, wire things up so that the case or switch handle becomes electrically "live." Old Uncle Skip does not want you to fry the fish in your aquarium, or yourself, for that matter. BE CAREFUL. HOUSE WIRING CAN KILL!!!

Two other sources of interference commonly overlooked by the beginner (and sometimes forgotten by the "Old Pro") are fluorescent lights and color TV sets.

Florescent lights kick up quite a racket. If your listening post has them, you may find that the only way to dig out weak signals will be to turn the tube lights out and DX by the dial light.

Color TV sets contain what is known as a sweep oscillator. It runs at 15.75 kHz and can generate harmonics that can cause interference in your receiver through the

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HF bands into even the lower VHF bands. Put simply, if you plan to buy one of Bob Grove's SR1000 super receivers, you are going to need to turn off the TV set when you use it.

Listeners who live in apartment complex settings can tell you where every single "birdie" is located on their radios. They are faced with interference from their neighbors watching "The Wonder Years." As I said earlier, some interference can't be fixed. You learn to listen around it and still have fun!

Otherness

Old Uncle Skip has been sharing his pearls of radio wisdom in the pages of *Monitoring Times* for about a year now. I like to keep my readers "in the loop" so why not take a few minutes to drop me a line and tell me how I'm doing?

I'm always on the look-out for column ideas, especially centering on beginners and budget radio. It's been a fun year and I look forward to keeping Uncle Skip's Corner full of fun and facts.



READER FEEDBACK

... it's the kind of "interference"
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New Frequencies: An exercise in deductive seeking

The advent of the 32 or 64 channel Motorola Syntor X 9000 series radios and their wide use by federal agencies present new problems to federal monitors. In the past, the feds just didn't have so many channels available and were limited by both equipment and available frequencies. The Syntor X 9000 series has solved their equipment limitations and coordination with IRAC and other federal agencies have yielded new frequency assignments.

The challenge, and hence the problem, for the federal monitoring enthusiast is to seek out and find the new operating frequencies and their respective channel number assignments. The Federal File this month examines in detail techniques to accomplish this in your own radio room.

The challenge of searching and finding the new frequencies should be approached as a logic problem. The first step is to think about the problem prior to attempting to solve it. Once your thoughts are gathered and focused on the problem, then proceed with the task of solving it.

The solution to the problem is found by determining the unknowns -- in this case new frequencies -- based upon the knowns and past history.

The knowns are parameters such as existing frequencies in use, type of radio equipment utilized, and the typical frequency operating ranges that an agency would utilize. Past history will also assist in the determination of the unknowns as a correlation may exist between the old and new channels or an agency's past operating habits of

channel usages.

The best illustration of this technique may be conveyed with an example. Let us assume that the problem is finding new frequencies or channels in use by the local FBI district which recently converted to a 32 channel system.

Pausing a moment, reflect on the task at hand and think about the resources and tools available for assistance in solving the problem.

Available resources can be frequency directories, personal monitoring notes or logs, scanner magazine articles or a fellow monitoring enthusiast. The basic tools are the old paper and pencil. Beyond that, the use of computer spread sheet or data base programs may be of use.

Once the resources have been thoroughly examined, start with the knowns.

First generate a frequency matrix chart based upon the known frequencies in use. The matrix chart will be a useful tool in the search for the new frequencies. The output of the matrix chart will be a set of frequencies where additional operating channels are likely to be monitored.

Table 1 lists a hypothetical "known" FBI frequency usage chart for the 167 MHz range. The 167 MHz range is used by the FBI for simplex operations and inputs to repeaters. Note that the table lists all standard FBI assignments in the 167 MHz range.

Table 1

	.X000	.X125	.X250	.X375	.X500	.X625	.X750	.X875
X=2	na	1		1		1	X	A
X=3	X	1		1	X	A	X	1
X=4		X	A	X	1		1	
X=5	X	A	X	1	X	A	X	1
X=6		1		1		X	A	X
X=7	1		X	A	X	1	X	A

The horizontal rows are the most significant digit of the frequency and the vertical columns are the remaining digits of the frequency. An example is the row where X = 3 and the column .X375, the resulting frequency is 167.3375 (the 167 is left off for brevity), similarly where X = 4 and column .X625, the resulting frequency is 167.4625.

An "A" in the chart denotes an active frequency; a "X" denotes frequency removed from consideration (explanation to follow in text) and "na" denotes a frequency that is not applicable.

Eight frequencies were identified as being active, the status of the remainder are unknown. The frequency resolution of the "typical" radio in use by the FBI is 12.5 kHz, with a bandwidth of 15 kHz.

The frequency resolution implies that all usable frequencies are multiples of the resolution of 12.5 kHz, i.e. 167.0125 MHz and 167.0250 MHz.

The bandwidth is the amount of the frequency spectrum occupied by the transmitted signal which, generally speaking, is centered about the transmitting frequency (with respect to the examples in this column).

A general rule applied to prevent co-channel interference is that no two operating channels will be adjacent to each other (i.e. 167.2875 and 167.300 -- both would not normally be used in the same district). Taking this rule into consideration, 24 frequencies are remaining which may be in use.

The frequencies removed from consideration are marked with an "X." The number of 24 frequencies may at first seem a large number; however, recall each new frequency found eliminates its two neighbors from further consideration, hence reducing the possible amount by three for each new frequency found.

The 24 frequencies may be programmed into an unused bank in your scanner and connected to a VOX (voice activated) type tape recorder for unattended listening.

After a week of monitoring in this manner, any activity on the 24 frequencies will become apparent. Then the search or hunt starts to track down and determine the exact frequency or frequencies in use. The search process can be aided by a few tricks to quickly zero in on active frequencies.

The rule of no two adjacent frequencies can be applied to limit the initial search parameters (number of frequencies). Four-

teen frequencies are selected for the first round after applying the rule and are denoted by a "1" in the table.

These fourteen frequencies are programmed into the unused bank and are searched for activity. Assign the first frequency (in the example, 167.2125) as a priority channel and enable the priority channel when the scanner is in the scan mode.

By configuring and enabling the priority mode to a given channel, any activity on the priority channel will become known when listening to the recorded tape.

If the frequency monitored and taped was not the priority channel, then a clicking noise would be heard on the tape indicating that the scanner was switching to the priority channel to check for activity. Conversely, if no clicking noise was heard, then the transmission occurred on the priority channel.

The priority channel feature can assist in the determination of active frequencies. When each new active frequency is determined, repeat the process with elimination of adjacent frequencies and use of the priority feature.

After several weeks of applying this technique, several new frequencies can be found and the list of probable new frequencies will dwindle away.

Once the active frequencies have been determined, only part of the problem is solved. Channel designators for the new frequencies are desired for a complete solution.

The channel designators may be found by either explicit or implicit means.

Explicit means are when the agents or a base directly refer to the channel while in use. An example would be "740 to any squad 3 signal on A-1" with A-1 being the frequency monitored. Another example would be when units say switch to A-6 and then the same units are monitored on a different frequency from A-1.

The explicit means require active monitoring with the monitor present or the recording of one frequency, or two frequencies with the priority feature enabled.

Implicit means are such that the channel designator was not confirmed directly as in the previous paragraph, but rather through deduction based upon monitored conversations. An example would be one agent stating to another that the repeater channel at the local office is in the B-5 position.

In this case the actual frequency was not monitored, however, by knowing the repeater channel of the local offices, its channel designator is most likely B-5. The channel designator is not 100 percent confirmed until actually monitored.

Deduction and logical assumption are powerful tools in finding channel designators and new frequencies.

The original problem of finding new frequencies in a 32 channel system could be assisted further simply by knowing the number of channels. The example started with eight confirmed active 167 MHz frequencies, which when deducted from 32 produce a remainder of a maximum of 24 operating frequencies.

One or two channels are dedicated to communications with state, county, and local police departments through channels such as



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LEERN (Law Enforcement Emergency Radio Network) or Intercity frequencies (i.e. 155.370, a common intercity frequency).

Each district will have at least two, if not three or more, repeater channels usually in the 163/164 MHz range. One repeater is used as the primary operating channel by the local offices and the second repeater as the primary operations channel of the district HQ.

The original 32 channels have quickly been reduced to 20 unknown frequencies. Further investigation, and knowing about past operations show that some repeater input frequencies are also used in a simplex mode on another channel.

So one frequency may be used in several channel configurations. The Syntor X 9000 series radios are DES capable and all FBI districts are currently under integration to some level of DES capabilities.

Some districts configure their bands as DES and non-DES, both utilizing the same frequencies. Now the problem has boiled down to finding only a small handful of frequencies and not 24 as originally possible.

Monitoring with friends or associates will greatly assist in the search activities and will be quicker and more efficient. Keep excellent, organized notes on your monitoring and findings. Remember that you will not solve the problem in a day or even a week, so it is important to keep good notes that you can call upon in the future.

Good monitoring til the next Federal File column.

mt

CORRECTION: Last month's look into Air Force One contained a number of historic photos. Unfortunately, those of the President Ford era AF1 found on pages 2 and 40 were not properly attributed. They were, in fact, taken by veteran shortwave listener Steven J. Handler. We apologize for the oversight.

New York: Maritime VHF Frequencies

As promised in my last column we will continue looking at New York state, particularly VHF stations. As with the MF-HF listing, the Coast Guard has been omitted from the list to save space. Since 156.800 MHz (channel 16) is compulsory for all stations, it has also been omitted. The abbreviation Y.C. is used for Yacht

Clubs.

The U.S. Coast Guard can readily be heard on 156.800, 157.100, 157.050, 157.075, 157.100, 157.125, 157.150, 157.175 MHz. Their transmitters generally use 50 to 75 watts as compared to the 25 watts transmitter power used by other stations, thus making the coast guard relatively easy

to hear on VHF.

Should you have any corrections to this, or any other information which appears in this column, I am always happy to hear from you. Suggestions for topics for future columns are also always welcome. Good listening -- until next time.

mt

Frequency	Callsign	Station	Location	156.450	KLU 817	Black Rock Y.C.	Fisher's Island
156.350	KBP 350	Great Lakes Dredge & Dock	Staten Island	156.450	KOM	Griffith Marine Navigation	New Rochelle
156.350	KIL 762	Henry Gillens & Sons Ltd.	Oyster Bay	156.450	KPB 510	Pirates Cove Marina	Fisher's Island
156.350	KZI 855	Black Dog Marine Inc.	Shelter Island	156.450	KPB 614	Poling Transportation	Staten Island
156.350	WBV	Moran Towing and Transportation	New York	156.450	KQU 639	Ontario Properties Inc.	Rochester
156.350	WQB 584	Hudson River Cruises	New Paltz	156.450	KRS 889	Town of Huntingdon	Huntingdon
156.425	KFN 320	R & L Communications	New York	156.450	KVR 440	Boyd, Weir & Sewell	New York
156.425	KVR 424	Heine Marine Electronics	Islip	156.450	KXS 248	Ocean Beach Village	Ocean Beach
156.425	KXE 303	Stevens Marine Radio	Rochester	156.450	KYN 515	Steven E. Summer	Setauket
156.425	KXS 248	Ocean Beach Village	Ocean Beach	156.450	KYN 771	Safe Boat Transfer Ltd.	Mamaroneck
156.425	KYN 515	Steven E. Summer	Setauket	156.450	KZV 765	Oak Park Marine	Rose East
156.425	KZE 664	Sailor's Supply	Youngstown	156.450	WDJ 333	Charles F. Bongidro	Northport
156.425	WHG 522	Phillips Communications	Henderson	156.450	WDT 548	Northern Boat Sales	Latham
156.425	WHG 584	Haylett Marina Inc.	Plattsburgh	156.450	WDT 554	Pells Fish Dock	Greenport
156.425	WHG 635	Enterprise Marine	New Platz	156.450	WFA 715	Doug Westin's Boat Shop	Sayville
156.425	WHG 889	Hudson River Maritime Services	Kingston	156.450	WHD 516	Howard M. Hild	New York
156.425	WHH 218	Sodus Bay Marina	Sodus Point	156.450	WHD 635	Enterprise Marine	New Paltz
156.425	WHU 339	Braddock Bay Marina	Rochester	156.450	WHG 889	Hudson River Maritime Services	Kingston
156.425	WHU 348	Tadsen's Fishing	East Moriches	156.450	WHH 209	Navy Point Marine	Sackets Harbor
156.425	WQA 348	Louie's Marina	Port Washington	156.450	WHU 339	Braddock Bay Marina	Rochester
156.425	WQA 858	County of Ulster	Kingston	156.450	WHU 348	Tadsen's Fishing	East Moriches
156.425	WQB 525	Trade-a-Yacht Marina	Union Springs	156.450	WHU 676	James Miller Marine	Staten Island
156.425	WQX 633	Youngstown Y.C.	Youngstown	156.450	WQA 217	Mid Lakes Navigation	Skaneateles
156.425	WQX 662	Henchman Marina	Henderson	156.450	WQA 283	Goldsmith's Radio & Electronics	Southold
156.425	WQZ 380	Bayles Dock Inc.	Harbor Port	156.450	WQB 343	Town of Oyster Bay	Syosset
156.425	WQZ 473	Dock & Coal Marina	Jefferson	156.450	WQB 676	Leonard G. Knotoff	East Quogue
156.425	WRD 723	Hi-Way Marina	Plattsburgh	156.450	WQB 808	Mau S. Marineland Inc.	New Hope
156.425	WRD 814	Joseph A. Swift	East Moriches	156.450	WQB 850	Wexler/Aprea Fishing Co.	East Marion
156.425	WRS 959	Town of Shelter Island	Ontario Shelter Island	156.450	WQB 892	Worldwide Electronics	Staten Island
156.425	WXY 919	AAT Communications	Staten Island	156.450	WQZ 408	Great Ocean Supply Co.	Long Island
156.425	WXZ 417	Sea Land Communications	Rochester	156.450	WQZ 479	Standard Boat Company	New York
156.425	WXZ 462	Imperial Y.C.	New Rochelle	156.450	WRD 723	Hi-Way Marina	East Moriches
156.425	WXZ 544	Riverside Marina	Half Moon	156.450	WRD 822	Johnson Maritime Services	New York
156.425	WXZ 583	Henderson Harbor Y.C.	Henderson	156.450	WRS 959	Town of Shelter Island	Shelter Island
156.428	WHD 812	Thomas M. Rundell	Harbor Highland Falls	156.4599	6	Pierce Marine Corp.	Youngstown
156.450	KEJ 765	Poling Transportation	Staten Island	156.450	WRV 555	J.H. Winchester & Co.	New York
156.450	KFN 218	American Y.C.	Rye	156.450	WXZ 405	Nichols Yacht Yards	Mamaroneck
156.450	KFN 320	R & L Communications	New York	156.450	WXZ 417	Sea Land Communications	Rochester
156.450	KFN 377	State of New York	Stony Brook	156.450	WXZ 475	Blaines Bay Marina	Colonial Village
156.450	KFN 750	Moran and Kurz Shipping	New York	156.450	WXZ 497	Stony Brook Y.C.	Stony Brook
156.450	KIY 833	Amerada Hess Communications	New York	156.450	WXZ 544	Riverside Marina	Half Moon
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156.500	KXE 303	Stevens Marine Radio	Rochester
156.500	WFA 735	Doug Westins Boat Shop	Sayville
156.500	WHD 513	Mobil Oil	Staten Island
156.500	WQA 289	Bouchard Transportation	Hicksville
156.500	WQB 434	Sayville Marine Center	Sayville
156.500	WQB 854	Nautlius Charter Service	Hilton
156.500	WQX 639	Montauk Oil Transportation	New York
156.500	WRS 925	Frank Domanick	Island Park
156.500	WRV 425	Frank T. Eldredge	East Marion
156.500	WXZ 283	SS & Y Agency Corp	New York
156.550	WAG	St. Lawrence Seaway	LaFargeville
156.550	WHD 513	Mobil Oil	Staten Island
156.575	WQB 582	Benjamin Barnes 3rd.	Southampton
156.600	KEA 707	Great Lakes Towing	Tonawanda
156.600	KEF	St. Lawrence Seaway	Eisenhower Lock
156.600	WAG	St. Lawrence Seaway	Alexandria Bay
156.600	WAG	St. Lawrence Seaway	LaFargeville
156.600	WUD 21	U.S. Army	Buffalo
156.650	WAG	St. Lawrence Seaway	Sodus
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156.650	KJB 288	Amtrak	New York
156.650	KLU 754	City of New York	Jamaica
156.650	KQU 366	City of New York	Jamaica Bay
156.650	KXS 237	Staten Island Railroad	Staten Island
156.650	WAG	St. Lawrence Seaway	Alexandria Bay
156.650	WAG	St. Lawrence Seaway	LaFargeville
156.675	KGW 353	Bluepoints Company	West Sayville
156.700	KEF	St. Lawrence Seaway	Eisenhower Lock
156.700	WAG	St. Lawrence Seaway	Alexandria Bay
156.700	WAG	St. Lawrence Seaway	LaFargeville
156.700	WUD 21	U.S. Army	Buffalo
156.725	WRV 555	J. H. Winchester & Co.	New York
156.850	KEA 693	New York Telephone Co.	New York
156.850	KFN 377	State of New York	Stony Brook
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156.900	KYV 571	Hudson River Pilots	Greenbush
156.900	WHD 675	City of New York	Yonkers
156.900	WHG 848	Edwards Electric	New York
156.900	WHU 422	Maritime Association	Fisher's Island
156.900	WQA 234	Mid-Hudson Marine	New York
156.900	WQB 424	Bald Eagle Marina	Milton
156.900	WXY 919	AAT Communications	Kendall
156.900	WXZ 540	Marine Towing & Transport	Staten Island
156.900	WXZ 552	Bill Black Agency Inc.	Oswego
156.925	WHD 565	Baytronics Industries	Staten Island
156.950	KEF 722	Spentonbush Transportation	Hampton Bays
156.950	WXZ 416	Mid-Hudson Navigation	New York
156.975	KGW 353	Bluepoints Company	New Paltz
156.975	KPB 566	Morania Oil Tanker Co.	West Sayville
156.975	KYV 670	Duane Marine Salvage	New York
156.975	WHD 565	Baytronics Industries	Staten Island
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			New York

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157.025	WHD 850	Offshore Electronics	Staten Island
157.025	WHU 263	Boat Pauline III Inc.	East Quogue
157.025	WHU 313	Marine Engine Specialists	Staten Island
157.025	WRD 814	Joseph A. Swift	Ontario
157.100	WAG	St. Lawrence Seaway	Sodus
157.100	KEF	St. Lawrence Seaway	Eisenhower Lock
157.100	WAG	St. Lawrence Seaway	Alexandria Bay
157.100	WAG	St. Lawrence Seaway	LaFargeville
157.175	WAG	St. Lawrence Seaway	Sodus
157.175	KEF	St. Lawrence Seaway	Eisenhower Lock
157.175	WAG	St. Lawrence Seaway	Alexandria Bay
157.175	WAG	St. Lawrence Seaway	LaFargeville
161.825	KIL 929	Lorain Electronics Corp.	Ripley
161.850	KEA 693	New York Telephone Co.	New York
161.850	KLU 788	Tel-Page Corporation	Rochester
161.900	KEA 69	New York Telephone Co.	New York
161.900	KFL 99	Tri City Telephone Co.	Schnectady
161.900	WBL	Kenilworth Electronics	Martinsville
161.925	KIL 929	Lorain Electronics Corp.	Ripley
161.925	WHU 638	Mats	New York
161.950	KLG 325	Tri City Telephone Co.	Fishkill
162.000	KGW 417	State of New York	West Beekman
162.000	WBL	Kenilworth Electronics	Martinsville
162.000	WFA 735	Doug Westins Boat Shop	Sayville

Go Pound Brass

For many hams, "pounding brass" or sending Morse code is a joy and pleasure. Sending Morse became known as "pounding brass" because the early telegraph keys were made of brass.

Brass may still be the metal of choice when it comes to keys. But little else remains the same.

Early Keys

Railroad-type telegraph keys were pressed into amateur service from the very beginning. They were the most practical and easily obtained devices that could be used to form the dits and dahs of the Morse code. Called a straight or hand key, they are still in daily use at many amateur stations (see top photo).

The straight key does have its drawbacks. The first of these is speed. It is difficult to send much over 18 or 20 words-per-minute with one and it's nearly impossible to hit 25 WPM -- and maintain it -- on one of these pump handles.

Another problem many have with a straight key is the correct timing of characters, especially after a long operating session.

A Better Idea

In an effort to increase speed and reduce operator fatigue, several keys were developed that used a side-to-side motion rather than tapping. The earliest efforts to build a sidewinder (as these keys were called) used two standard telegraph keys mounted back to back and secured in a vertical position.

These keys were a great improvement over the single railroad key and found favor in many ham shacks. Traffic operators were especially quick to use side-winders to ease the chore of sending stacks of messages. Early radio magazines abounded with designs for these unusual keys and a few manufacturers made commercial models available.

The side-winder, while a big improvement, also had drawbacks. The major problem with these keys was a pronounced slurring of sent code. And getting one adjusted properly could take several operating sessions.

The Bug

"Bugs" or semi-automatic keys had been around almost since the beginning. But one

thing kept them out of the hands of most amateurs: cost.

There were, of course, several home brew designs for bugs. One popular model used a hack-saw blade to form the vibrating dit reed and others used reeds made of various materials (one took the spring steel from ladies corsets!).

However, a commercial model held sway during the hey-day of the bug, manufactured by the Vibroplex company. It is still a popular key today.

Electronic Keys

The effort to find the perfect key goes on. In the late fifties and early sixties some hams began to construct electronic keyers that made fully automatic dahs as well as dits.

The early paddle was usually a cannibalized bug that had the vibrating reed removed. In some cases the old idea of back-to-back straight keys was used. And eventually commercial units became available (again led by Vibroplex).

Memory Keyers

Digital electronics brought about a revolution in automatic keyers. Memory keyers became practical using digital techniques (see photo next page). Keyers that can be programmed to store and send several different messages at the stroke of a key are easily built.

Memory keyers find use mainly among contest operators and DXers who send short and often repeated messages. Some hams will program preliminary QSO data such as name, QTH and rig into a memory keyer and



Strong and reliable J-37 military surplus straight key

use them when initiating a QSO.

KEYBOARDS

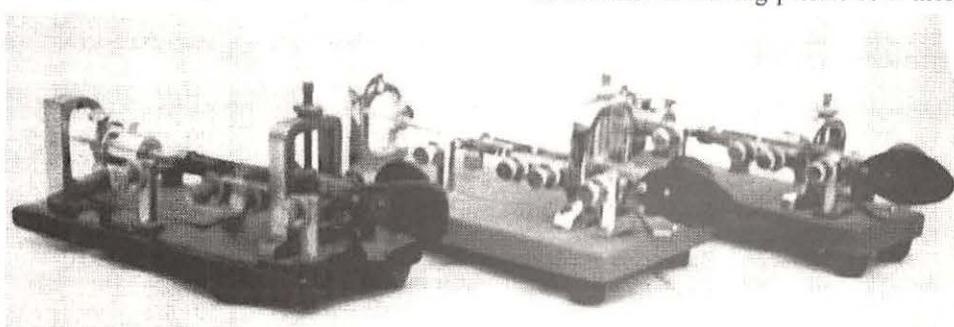
Ever sit on the low end of 40 meters and listen to CW being sent at 75 plus WPM? The guys sending it are using keyboards -- specially designed keyers that use a standard typewriter keyboard to make perfect Morse characters.

There are two basic types of keyboard, the dedicated keyboard that does nothing except send Morse, and computer keyboards which are simply computers using software and an interface to send code.

There are many interfaces on the market that will turn your computer into a keyboard; Manufacturers such as MFJ, Kantronics and AEA all produce this type of device. Check your local ham radio outlet for prices and features.

Most of these keyboards have buffers (a memory that will accept and hold a certain amount of text) built into them. Use of the buffer allows the operator to answer questions as he is copying the other station and assures the sending of text at perfect speed.

In addition to sending perfect code most



Three of the famous Vibroplex bugs; On the left is an early model (appears to have been a prototype). It is about 60 or more years old. Next is an Original which is the most popular of the Vibroplex line. And on the right is a compact bug called a Blue Racer.

keyboards are interfaced to the receiver and will copy code at up to 100 WPM with ease. What is really neat about using a keyboard is the fact that before long your ability to copy code increases enormously.

I doubt if there are many keyboard operators who cannot copy good CW at 60+ WPM! Seems that seeing the code appear on the screen as you hear it reinforces your ability to copy at higher and higher speeds. If you are trying to upgrade to General or Extra this might be a good way to build up your copying speed.

Many feel Morse is doomed to go the way of the Passenger pigeon; however, I think Morse is going to be with us for a long time yet. The reason I believe this is: because Morse is fun to use, it is efficient and anyone can build a simple one or two stage transmitter capable of sending your thoughts half-way around the earth using Morse code.

Learning the code is an accomplishment one can be proud of. I would hate to think that every ham coming into the hobby today will forget Morse as soon as his license is assured! (Yes, I still favor a no-code license.)

MIR QRT

Due to electrical problems aboard the space station the MIR Cosmonauts returned to earth on April 27. A repair crew will be sent to MIR in August to repair the problems.

With luck MIR will be back on two meters later this summer.

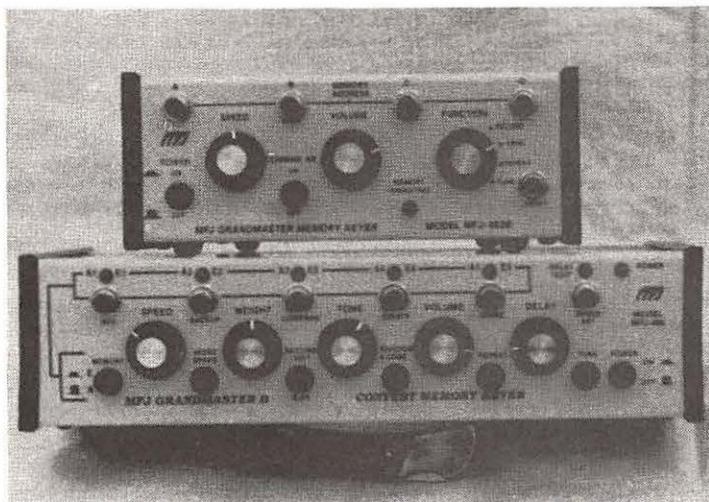
Propagation

Solar flux levels have fallen off somewhat. In spite of low levels, many good six and ten meter openings have been available to South America, New Zealand and Africa.

Paths to southern regions of the earth should remain good throughout the summer, although Great Circle paths (i.e. over the north pole) will not be good during this period.

Congress Investigates 220-222 Giveaway!

The Government Operations Subcommittee has decided to investi-



Two examples of electronic keyers. On top is the MFJ-4828, an economical memory keyer. The lower unit is called the Grand Master II Contest Memory Keyer (also by MFJ); this unit takes a lot of the pain out of contest operating with loads of neat features.



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ham radio magazine, Dept. MT, Greenville, NH 03048

gate the FCC action in removing Amateurs from the 220-222 MHz band. The question is whether the FCC abused the administrative process by their action. Hope we have good news next column.

VHF

Do you operate SSB, CW, RTTY, TV (fast or slow scan) or any other mode besides FM above 50MHz?

There has been very little input here about VHF activity. I feel all of us could make better use of this portion of the spectrum. To that end, I would like to hear from anyone who is active on different modes on those frequencies.

The potential for working DX on VHF is much greater when using CW or SSB. In fact, modest stations with simple 6 to 15 element single bay beams often work 200 plus miles regularly on two meter SSB.

Given all the space we have on VHF/UHF it would be a good idea to start using these bands to their fullest extent. Think of the break it would give 75 meters if we could move up to 50, 144, 220, 432 or even higher! Not only would it relieve some of the congestion on the HF bands, activity there will go a long way towards convincing potential band grabbers that we do need those bands.

If you are doing anything on VHF/UHF other than yakking on repeaters, (yes, I would like to know about simplex FM activity too) please drop me a note and let me know what is going on. Perhaps we can stimulate some activity on these bands—IDEAS PSE—

Once more we come to the end of another "On the Ham Bands", see ya next month.

73 -- Ike, N3IK.

Alaskan Waters

NNHB, U.S. Coast Guard Cutter Yocona, 16587 kHz-USB. Full data prepared form card, without verification signer. Received in 23 days for an English utility report, a souvenir postcard, and return postage. Station address: 65Y SUPRTCEN Kodiak, Kodiak, AK 39501. (Richard Albright, Merced, CA)

Brazil

Radio Cultura do Para, 5045 kHz. Preprinted QSL letter with partial data, and misprinted frequency. Stickers and travel brochures enclosed. Verification signer, Ronald Pastor, Diretor de Radio, Fundacao de Telecommunicacoes. Registered mail reply received in 23 days for a Portuguese report and two IRCS. Station address: Av. Almirante Barroso, 735-CEP 66.000, Belem, Para. (Bob Landau, Secaucus, NJ)

Gabon

Afrique Numero Un, 4830 kHz. Partial data station logo card, without verification signer. Received in 103 days after third French report and one U.S. dollar. Station address: Boite Postal No. 1, Libreville, Gabon. (Richard Coday, Oildale, CA) (Kenneth MacHarg, Jeffersonville, IN)

German Federal Republic

Sender Freies Berlin, 6190 kHz. Full data QSL card (map and station insignia for both SFB and Radio Bremen on shared QSL), without verification signer. Also received two stickers, program schedule, and international SW frequency booklet schedule. Received in 31 days for an English/German report. Station address: D 1 Berlin 19, Masurenallee 8-14, Federal Republic of Germany. (Bob Landau, Secaucus, NJ)

Guam

KTWR, 11805 kHz. Full data QSL card. Verification signer, Flora Rittenhouse. Received in 31 days for an English report, and U.S. mint stamps. Station address: P.O. Box CC, Agana Guam 96910. (Bob Combs, Campbell, CA)

NRV, U.S. Coast Guard Station, 22527 kHz-USB. Full data letter. Verification signer, R. Wilkins. Received in 20 days for an English utility report and U.S. mint stamps. Station address: NRV, Box 149 NCWP, FPO San Francisco, CA 96630-1845 (Bob Combs, Campbell, CA)

Gulf of Mexico

DHOU, MS Puritan (West German banana ship), 16587 kHz-USB. Full data prepared form card and a color photo of the ship. Verification signer, Hans-Dieter Boehm, Radio Officer. Received in 30 days for a German utility report, a souvenir postcard, and one U.S. dollar for postage. Station address: c/o United Brands, Westpier, P.O. Box 1017, Gulfport, MS 39501. (Richard Albright, Merced, CA)

Israel

KOL Israel, 9385 kHz. Full data card of "City Skyline," without verification signer. Received in 34 days for an English report and one IRC. Station address: P.O. Box 1082, 91 919 Jerusalem, Israel. (Tom Maslanka, Cleveland, OH)

Kenya

Voice of Kenya, 4934 kHz. Full data station aerogramme letter. Verification signer, Augustine



Kerjanjiri Gachiu for Chief Engineer. Received in 66 days for an English report and one U.S. dollar. Station address: Engineering Division, P.O. 30456, Nairobi, Kenya. (Richard Coday, Oildale, CA) (Aboe Thaliep, Batang, Indonesia)

Pacific Coast

NNOCNH (MARS), USS New Jersey (battleship), 13825 kHz-USB. Full data form card and color photo of the ship. Received in 30 days for an English utility report, a souvenir postcard, and return postage. Station address: FPO San Francisco, CA 96688-1110. (Richard Albright, Merced, CA)

WSLH, SS Maui (U.S. container ship), 12432 kHz-USB. Full data prepared form card. Verification signer, Chief Radio Officer. Received in 7 days for an English utility report, a souvenir postcard, and return postage. Station address: Matson Navigation Co., P.O. Box 7452, San Francisco, CA 94120. (Richard Albright, Merced, CA)

Philippines

Voice of America relay, 11715 kHz. Full data QSL card. Verification signer, Kathryn Ziehon. Received in 11 days for an English report. Station address: VOA, Washington, DC 20547. (Bob Combs, Campbell, CA)

Taiwan

Voice of Free China, 5985 kHz. Two full data QSL cards and station stickers, without verification signer. Received in 76 days for an English report and one IRC. Station address: P.O. Box 24-38, Taipei, Taiwan, Republic of China. (David Fields, Louisville, KY) (Richard Coday, Oildale, CA)

Turkey

Voice of Turkey, 9445 kHz. Full data color "embroidered purses" (shown above), stickers, and program schedule, without verification signer. Received in 33 days for an English report. Station address: Turkish Radio-TV Corp. P.K. 333, 06-443 Ankara, Turkey. (Thomas Maslanka, Cleveland, OH)

United Arab Emirates

UAE Radio-Dubai, 17775 kHz. Full data QSL card, with verification signer. Received in 36 days for an English report and two IRCS. Station address: P.O. Box 1695, Dubai, United Arab Emirates. (David Fields, Louisville, KY) (Bob Combs, Campbell, CA)

United Kingdom

Royal Air Force-Volmet, 11234 kHz-USB. Full data

"RAF Strike Command" card. Verification signer, Communications Officer-Brampton. Received in 11 days for an English utility report and two IRCS. QSL address: Huntington, Cambridgeshire PE 18 8G, U.K. (Bill Battles, East Kingston, NH)

United States

WKND-1621.2-AM. Full data paper logo QSL and station information sheet, without verification signer. Received in 59 days for a SASE. Station address: 3007R 4th Avenue, Beaver Falls, PA 15010. (Harold Fodge, Midland, MI)

WJDI-1620-AM. Full data letter with station logo and studio picture. Verification signer, Dave C.E. Received in 10 days for a SASE. QSL address: P.O. Box 142, Cottekill, NY 12419. (Harold Fodge, Midland, MI)

U.S. Air Force-NCIRLIK, 13214 kHz-USB. Full data "USAF GCSS INCIRLIK" QSL card. (As promised, it was the first QSL off the press.) Verification signer, S. Sgt. Valerie J. Minchew, Oper. GCSS. Received in 36 days for an English utility report and U.S. mint stamps. Attention: Chief Radio Officer, APO New York, NY 09289-6346. (Bill Battles, East Kingston, NH)

U.S. Coast Guard Air Station-Corpus Christi, TX. 5696 kHz-USB. Full data letter, with invitation to visit air Station. Verification signer, Bob Modjelewski, RM 1, for an English utility report. Station address: c/o Commanding Officer, U.S. Coast Guard Air Station, Corpus Christi, TX 78419-5500 (Bill Battles, East Kingston, NH)

U.S. Coast Guard Cutter Point Bonita, 3253 kHz-USB. Prepared card stamped with the Cutter's Stamp of Crest. Verification signer, J.F. Trumble, LTJG, for an English utility report. Ship address: Commanding Officer, USCGC Point Bonita (WPB 82346), c/o COGARD Grp. Woods Hole, MA 02543-1099. (Bill Battles, East Kingston, NH)

Yemen Arab Republic

Radio San'a, 9779 kHz. Full data letter with station stamp and souvenir postcard. Verification signer, Abdullah Farhan. Received in 147 days for an English report. Station address: Ministry of Information, San'a, Yemen Arab Republic. (Nick Grace, Harvard, MA)

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U.S. Hobbyist First to Copy Piccolo

On May 27th the first Piccolo loggings were made by a shortwave listener in the U.S. Dr. Dave Wilson of Fredericksburg, Virginia, with the help of a decoder that was designed and built by myself, was able to copy Piccolo on his Tandy 1000SL computer. The computer used software (also designed by myself with a little help from Dave) that stored tone numbers in a computer disk file. The disk file was sent to a printer and the printed copy was hand decoded using a chart which appeared in the February 1989 issue of *MT*.

This method is crude, but it's the only way, at this time, to copy Piccolo. We were able to prove that there is Piccolo in the clear! I will try to develop software which will decode it in real time.

The tone decoder circuit that we used, compared to the British equipment, is quite simple. It does, however, require six tone filters, two predetection filters, an auto threshold circuit and logic circuitry.

It's not a project that can be taken on by the average listener. Dave said that the decoder was susceptible to noise but it separated the tones very nicely. If the NRD 525 was off by only a few Hertz, the decoder's LED's would indicate the mistuning.

After spending several days of decoding and tracking Piccolo stations, Dave was able to determine that MSS on 19005 in the country of Belize was operating a link to MKK in London. Several years ago MSS was operating on the same frequency using an FDM link with RTTY and TDM modes mixed in the aggregate channels. This system is very similar to the CCITT recommendation R.36 which is very rare, these days, on the SW bands.

Dave believes that MSS uses Piccolo on other frequencies and these frequencies match old MSS/MKK loggings. It was believed that MSS went off the air about the time the country of Belize (southeast of the Mexican border) became independent from Great Britain. But the real truth is, MSS changed to Piccolo.

The frequencies that are used by MSS and MKK vary depending on the conditions, the day of the week and the MUF (maximum usable frequency).

Here is Dave Wilson:

"The first Piccolo decoded was on 19005 kHz. The station identified itself as MSS. This call is assigned to the UK military facility in Belize (a small nation in Central America to the east of Guatemala).

"A few years ago, MSS was regularly seen with Baudot and 96 Bd TDM in FDM to

station MKK - London, UK. Although MKK is still seen working other stations with RTTY, MSS has not been seen with RTTY for some time. It had been assumed that the station MSS had terminated operations. Now it is clear that the MSS/MKK link has gone to Mark VI Piccolo.

"The search started for other frequencies of this circuit. During daylight over the path, the two stations each use a high frequency; at night they move down to lower frequencies.

"One feature that distinguishes Piccolo of this link from most other Piccolo is that it is always two Piccolo channels operating in an

10760	RYIRYIYIYIYIYIYIYIYI-IRYIYIYIYIYIYIYI-RYIYIYIYIYI TEST DE MKK
	THE QUICK BROWN FOX JUMPS OVER THE LAZY DOG 1234567890 TEST DE MKK
	THE QUICK BROWN FOX JUMPS OVER THE LAZY DOG 1234567890 TEST DE MKK
16344	MSS DE MKK ZUB 1216z
19005	MSS RGRGRGRG AS1 WILL C WOT WE GHPOT KKK
19005	MSS AVE I MISSED SOMETHING WHO IS TRYING TO WERK ME BRAVO KKK
19915	MSS DE MKK ZUB 2004Z AND NEG O ARE YOU SEEING ME-K
19915	MSS DE MKK ZUB 1434Z AND YOU WERE OK ON THE SATTY
	JUST THAT I COULDN'T UNDERSTAND WHAT YOU SAID PLSE TO GO BACK
22922	555 I AM GETTING YOU GASH JUST GOING TO LOOPS THIS ND ILL GET BACK TO YOU K (not known if MKK or MSS)
24333	DE MSS AND RGRGR TKS KK
24333	MKK DE MSS AND GRG PLSE TO AS

Dave Wilson

FDM mode. Usually in USB, although MSS sometimes uses LSB, the lower channel is the order-wire (used for circuit coordination) and usually sends the idle (tone 5, 500 Hz, and tone 6, 520 Hz) when not active. This channel uses Piccolo tones 3 through 8 (420 Hz through 560 Hz with 20 Hz separation).

"The upper channel is 400 Hz higher and appears to be crypto-covered. (Up to four Piccolo channels can be put into an SSB FDM Piccolo transmission.)

"Frequencies found with the MSS/MKK Piccolo link are as follows:

MSS: 7822 12270 14710 17515 18420 19005
23850 24333
MKK: 9053 10249 10760 11605.5 13445 14473
16344 18525 19915 22922 23374
ID not heard, but probably probably MKK or
MSS: 16170.

"It has been discovered that the MSS/MKK Piccolo link uses many of the same frequencies that were used in the past for the MSS/MKK FDM RTTY link. Based on this, the following are probably also now used for the MSS/MKK link: MSS-8167, 9244, 10235, 13675, 15815; MKK-10480."

In Closing

The Piccolo project for me has been very challenging. It involved electronics and computer programming as well as the mechanical layout of the decoder.

Dr. Dave Wilson spent many hours monitoring and logging to Piccolo frequencies before the decoder was built. This allowed him to select the frequencies and determine the data that he presented in this issue. I thank him for his efforts.

I would also like to thank Jim Boehm of San Antonio, Texas, and Frank Shoemaker of

Examples of Traffic

Syracuse, New York, for their loggings and special thanks to Jack Gelfand of Hopewell, New Jersey, for the technical articles on Piccolo.

New Signals

Another strange signal called "Link 11" (which is used by the Navy) appeared to be very active during the Panama crisis. It appears that the increase in Link 11 activity can indicate that something's going on in the world!

RTTY Interferes with Scanners

I received reports from *MT* readers in Chicago that they were getting some sort of RTTY signal on their Bearcat 210 scanners. After tuning in 10.801 kHz, I noticed that RFL1 in Ft. de France, Martinique, was sending ARQ-E3 RTTY using 850 Hz shift. Apparently the signal is getting into the I.F. stage of the Bearcat when a long antenna is connected during band openings.

One way to solve this problem is to use the Grove directional scanner antenna or build a trap that will reject the interference at the scanner's antenna input.

NNN

Route 5, Box 156A
Louisa, VA 23093

K-Sat and FMA

As recently as a year and a half ago home dish owners had a choice of three TVRO directed audio services. The first was FM America (FMA) started by former commercial broadcaster Keith Lamonica. Later came K-SAT. A third, North America One (NA1), tried to steer a course between the first two.

FMA was originally launched in the summer of 1985 as a satellite audio service featuring a Middle-of-the-Road (MOR) music format for radio stations and cable companies. Between 8 and 11 p.m., Lamonica hosted his own talk show and soon discovered thousands of home dishowners were eager to commune on the satellite.

The Scrambling Threat

Fester below the horizon was the hideous spectre of satellite signal scrambling. As rumor turned to fact, Lamonica played on the indignation of dishowners who until then had enjoyed for free what everyone else in the country was paying for.

It wasn't long before FMA was no longer an FM and cable service, but a full time home dish service which provided the MOR music by day and an anti-scrambling public forum at night punctuated with pleas from Lamonica for funds.

The success of FMA did not go unnoticed. Fresh from the collapse of his triple X-rated Fantasy Unrestricted Network, Chuck Dawson decided to launch a new satellite venture called K-SAT. His audio service, which originated from his home in Gilroy, California, was described as the "TVRO War Channel" and took an aggressively adversarial approach to the changing face of home satellite TV. He used the service to harangue his opponents, real and imagined, and to exhort his "army" to flood their senators and congressmen with irate



Desperate plea to terrorists?
No, desperate plea to uplink facility not to pull the plug on this NBA backhaul. Post game interviews followed.

letters and to ask everyone to send more money.

It was a highly amusing time. Listeners were kept hopping from one to the other (both services were on the same satellite: SpaceNet I, but different channels) as each host tried to garner the loyalty of the dishowner and paint the other as a dupe of Big Cable.

Meanwhile, North America One fell on hard times. Forced to sell, NA1 was bought by a couple from Wisconsin who moved the entire operation by tractor trailer from Colorado to their home state. After setting up operations (in the same building as the Kaul-Tronics dishes are made), NA1 tried to establish itself as the first commercial TVRO oriented audio service.

Audio Civil War

By this time K-SAT and FMA were involved in a pitched battle. There was open on-the-air hostility between the two rivals. But it was Lamonica who proved to be the most vulnerable. His increasingly erratic on-air behavior, drinking, and swearing, and lashing out at those who opposed him had ceased to be amusing. He had turned away all but the most loyal of the FMA "family."

Dawson, seizing on the defections, pieced together a crude but shocking exposé of Lamonica. Shortly before its airing, Lamonica announced the "temporary" closing of FMA. It was not to return. The exposé, which lasted hours and ran continuously on K-SAT for days, detailed charges of alleged illegal activities and a past of dubious achievements.

NA1 and the SBCA

By now NA1 had found a source of revenue for its ailing cash flow. Teaming the SBCA (a TVRO trade lobby organization) and major programmers such as HBO with General Instrument (maker of the VideoCypher II encryption system), NA1 launched its "SBCA Information Network." It found a genial host in local small-town DJ Harry Thibedau who moderated the three hour nightly show.

Dawson, believing that the SBCA was little more than a mouthpiece for Big Cable interests, had a new straw man. But before the K-SAT army could go to work, NA1 began to crumble on its own.

Still not able to make ends meet, NA1 found itself once again on the auction block. The new owner was Liberty Lobby, an ultra right lobbying group based in Washington, D.C., which had little use for the SBCA Information Network. The program, along with its host, was dismissed.

SBCA Rises from the Ashes

Within weeks, the SBCA had arranged for the use of the 6.2 MHz subcarrier of G1, 18 (TBS), the sponsorship of the same consortium of cable programmers, and hired the out-of-work Thibedau to host the new SBCA Information Network from its headquarters in Washington, D.C. (The program continues to air M-F from 9-11 p.m. ET.)

Keith Lamonica has disappeared and FM America is history. Chuck Dawson is disappearing and K-SAT is history. Only affable Harry Thibedau, who has made a career out of side-stepping charges of partiality to cable interests, and the SBCA remain. One has to wonder how long.

MAIL BAG: Space Shuttle and Eurosat TV

New MT subscriber Todd Shideler of Jean, Nevada, enjoys following NASA space missions on his dish. "... during the recent space shuttle launch, I was able to tune in the NASA Satellite on F2-13. This channel allowed me an excellent uninterrupted view of the takeoff, without boring announcers, commercials, or interruptions of the audio signals from the shuttle.

"However, when I tuned in throughout the week, hoping to see the on-board video, all I saw was CNN being re-broadcast. Where can I find the in-flight video and video of the landing? Also, are there other NASA satellites, which are not scrambled, that broadcast the video or/and audio (radio traffic) from the shuttle?"

Todd, what you were watching was NASA Select, an audio/video service of NASA for the world's press. They feature liftoff to landing coverage of all launches including some not from the Kennedy Space Center.

After the launch of which you wrote, I think you inadvertently returned to G2 which is right next to F2. G2-13 is an occasional feed channel for CNN. I watched the same mission from beginning to end and most of the press briefings in between without any problems.

"In Flight" video from the shuttle is downlinked via S-band equipment operating around 2.6 GHz and out of the capabilities of home TVRO gear.

Todd also asks if there are "other government satellites being broadcast without scrambling. For example, I heard the U.S. Senate had one (not C-SPAN) that was used to send interviews back to the senators' home states..."

The senate "back hauls" to constituents are sent on transponders leased on a per use basis by whatever organization so desires. Sometimes a political party pays for a video conference which allows a congressman or senator to "meet" the folks back home without having to leave the friendlier confines of the Beltway.



What's wrong with this picture? Nothing if you happen to have a VC I commercial decoder. This is what Major League Baseball backhauls look like this year.

Expect more of this in the future as politicians discover this cheap way to hide in their Georgetown Condos while giving the illusion of being back home with the voters.

Look for these transmissions on W4, W5, T1, T2, T3. There's no schedule so you'll just have to stumble across them, but they'll be most evident every two years in the fall.

The only "government" satellites in the Clarke Belt are the Tracking and Data Relay Satellites (TDRS) which NASA had originally intended to replace its antique system of ground tracking systems. The big problem with the ground system is that there are lots of gaps between stations and the annoying LOS (loss of signal) always seems to come at the most inopportune times.

But the TDRS system has been slow to develop. Launched in 1983, TDRS-A (41 deg. west) had problems during deployment which has made it impossible to fully utilize its capacity.

TDRS-B went down with the Challenger in 1986. TDRS-C (171 deg. west), originally to be launched in June of 1988, was not sent up until March of 1989. Assuming it is at 100 percent operating capability, it will be the first fully functioning TDRS.

TDRS-D, to be launched in late 1988, isn't on the launch schedule for 1989. Even if it does go up in 1989, it is meant as a replacement for TDRS-A which is nearing the end of its lifetime. That will still leave NASA short one satellite, let alone have anything as a back up. So it looks like the folks at the ground tracking stations have some more job security.

Operating in frequencies ranging from 2.0 GHz to 14.2 GHz, NASA communications will not be receivable by home dish owners. Besides, they use their own encryption system even on the F2-13 transmissions when they don't want the world looking on.

One disturbing rumor I've heard in the last six months is that NASA is planning to move its NASA Select Channel to Ku. No word on when, which satellite, or transponder.



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Hand Held Series Frequency Counters and Instruments					
MODEL	2210	1300H/A	2400H	CCA	CCB
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APPLICATIONS	General Purpose Audio-Microwave	RF	Microwave	Security	Security
PRICE	\$219	\$169	\$189	\$299	\$99
SENSITIVITY					
1 KHz	< 5 mv	NA	NA	NA	NA
100 MHz	< 3 mv	< 1 mv	< 3 mv	< .5 mv	< 5 mv
450 MHz	< 3 mv	< 5 mv	< 3 mv	< 1 mv	< 5 mv
850 MHz	< 3 mv	< 20 mv	< 5 mv	NA	< 5 mv
1.3 GHz	< 7 mv	< 100 mv	< 7 mv	NA	< 10 mv
2.2 GHz	< 30 mv	NA	< 30 mv	NA	< 30 mv

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All counters have 8 digit red .28" LED displays. Aluminum cabinet is 3.9" H x 3.5" x 1". Internal Ni-Cad batteries provide 2-5 hour portable operation with continuous operation from AC line charger/power supply supplied. Model CCB uses a 9 volt alkaline battery. One year parts and labor guarantee. A full line of probes, antennas, and accessories is available. Orders to U.S. and Canada add 5% to total (\$2 min, \$10 max). Florida residents, add 6% sales tax. COD fee \$3. Foreign orders add 15%. MasterCard and VISA accepted.

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Transponder Notes

* Despite much ballyhoo on its scrambling, CBS appears to have abandoned its full time scrambling efforts. No word as to why.

* Just when you thought SelectTV would make it, it's gone. Stories about its financial rescue notwithstanding, the old premium movie channel has not been seen for weeks.

* Here's an item that might not have appeared in your local paper: The Satellite Business News reports on the mystery surrounding the crash of a DC3 airplane out of

Laredo, Texas, loaded with 400 VideoCypher IIs bound for Mexico. The report says the pilots might be linked to U.S. mercenaries operating in Central America. It is illegal to export VC IIs.

* The much heralded arrival of the VC II Plus has been delayed. This will not come as a surprise to anyone familiar with the General Instrument Company and its record on delivery promises. New date for roll-out for the VC II Plus is given vaguely now as "sometime next fall."

Back to the Future?

You can experience thirty years in thirty minutes! This isn't a trip back to the future. It's a new and interesting way to listen to the radio.

In North America, there is no shortage of FM radio stations to listen to. There are countless stations and they're all searching for listeners. You'll hear top 40, oldies, country, jazz, and classical music. Thousands of dollars are spent on research to develop and fine tune a radio station. Surveys are taken, listeners are brought in to audition records, and successful stations are copied by others.

The result is radio with a homogenized sound. Visit a shopping mall anywhere in the United States and it will always look the same. Turn on the radio, and it will always sound the same. Usually.

Paul Cavalconte decided to be different. He is the music director of WZFM in Briarcliff Manor, a suburb of New York City. WZFM sounded like every other light rock, adult contemporary radio station: Billy Joel, Barbara Streisand, The Beatles.

With 70 or more radio stations on the dial, he wanted to jump above the crowd and gain

popularity. If we categorize records by saying, 'Here's a real oldie,' it won't be accepted. Great songs go on forever.

"Look at the success of the movies American Graffiti and Dirty Dancing. Entire generations think of these songs as new music. It is, to them. We want to broaden people's taste in music. That's our appeal. And I think we are succeeding."

This concept could be called "thinking man's rock 'n' roll." Gary Theroux is a musicologist, as well as a disk jockey at WZFM. During the week, he is a music editor for *Reader's Digest*, diligently compiling multiple record sets of music of a certain era or genre for mail order sale.

Gary has written a book called *The Top Ten: 1956 To the Present*, with Bob Gilbert. "I researched the story behind the top ten records of each year since 1956. They didn't have to be rock 'n' roll. For instance, it took me eight months to find Prez Prado. He was in Mexico City. After that long search, I discovered he only spoke Spanish, so a friend of mine had to do the interview for me."

Listening to Gary and his co-host Kevin McCue, you can feel their love for music and their audience. "We don't like to be a 'disk jockey' and pontificate on the air. We talk to individual people," says Theroux.

"The station is always open for requests, and the phone calls come right into the studio. There is a wonderful feeling of being a part of the community. People call in if they have lost their dog or if they want to hear Fats Domino. WZFM has become a center of communication for New York's Westchester County, not just a radio station."

John Zanzarella, WZFM's general manager, doesn't think of it as an oldies station, even though you could consider 80 percent of what they play as oldies. "That's why we call it 'Quality Hits'. Do you consider Steely Dan or Chuck Berry an oldie? It's just good music."

It's not every station that can blend Amy Grant, U2, and the Buffalo Springfield together. It's sort of progressive rock, oldies, and contemporary hit radio all in one. That's what WZFM calls "quality hits."

Their innovation doesn't end at the transmitter. The station has found some equally unorthodox promotions to attract people to the station. WZFM was one of the first stations to use the Blaupunkt ARI system for traffic reports.

When the system is activated in the WZFM studio, traffic reports automatically override programming in cars with ARI equipped radios.

WZFM
107.1
HOME OF QUALITY HITS

Typical Playlist of "Thirty Years in Thirty Minutes" on WZFM

50s	Chuck Berry Monotones Beau Brummels	Maybelline Book of Love Laugh, Laugh
60s	Procol Harum Lovin' Spoonful	Whiter Shade of Pale Darlin' Be Home Soon
60s	Al Stewart Blondie	Time Passages Heart of Glass
80s	Rod Stewart Randy Newman	Love Touch Falling In Love
	John Cougar Mellencamp	Small Town

WZFM also scored a major coup by gaining permission of the county government to erect an official road sign on a major highway that flashes when WZFM's traffic reports are read. The flashing lights are activated when the ARI traffic alert system goes on.

WZFM also brings the bear out in people. In a joint effort with the Westchester County Department of Public Works, WZFM collected over 3000 teddy bears to be distributed to ambulances and police cars when children are involved in a disaster.

A teddy bear can make an enormous difference when given to a child that has just been in an accident, fire, or other emergency as a surprise. They have been distributed by police and fire departments and ambulance services all over the county. And, of course, the bears get permanently adopted by the children.

The station has also set up a computerized, pre-recorded, information hot line. Using a touch-tone phone, you can instantly hear about cultural events, movie times, weather, sports scores, and lottery results.

WZFM is a station that wants to be different and is hungry for attention. Using musical innovation and a personal touch with their listeners, they provide "quality hits" and quality radio.



An American In Paris

Parlez-vous Francais? If not, you may be searching the dials while vacationing in Europe this summer. While you're enjoying the celebration of the French Revolution's bicentennial, also enjoy the BBC World Service on 648 kHz.

Their 500 kW signal can be heard day and night in Paris en Anglais. The BBC's national networks can also be heard, especially at night: Radio One on 1053 and 1089 kHz, Radio Two on 693 and 909 kHz, and Radio Three on 1215



Gary Theroux, music director of *Reader's Digest* and co-host (with Kerin McCue) of the "WZFM Saturday Night Special"

attention. "You give us half an hour, and we'll give you the history of rock 'n' roll! Thirty years in thirty minutes!" Along with the station's consultants, he developed WZFM's "Quality Hits" format.

The station's philosophy is broad-minded and innovative. Gary Theroux, co-host of WZFM's Saturday Night Special request show, offers a simple description. "We don't think of music as being a hit of the 50s, 60s, 70s, or 80s. We look at a great song for what it is, not when it was recorded. If it evokes an emotion in someone, that's what's important."

"There are thousands of people who didn't hear these songs when they were initially



kHz. Also, catch The CBS Evening News on the Canal Plus TV network, Tuesday through Saturday mornings, at 8 a.m.. You can see Dan Rather with French subtitles!

American pop music is very popular on French FM radio. You'll never think you've left home listening to stations like Skyrack 96 FM and Fun Radio FM 102. Even some of the top 40 style jingles are sung in English.

The announcers have a very slick and sophisticated style, but they do speak in French. The FM band is packed with a great variety of formats and styles of music. And look for those S-loop antennas mounted vertically instead of horizontally! Interesting approach, and super listening!

Stopping in London? Write ahead to: The Ticket Unit, BBC, London, W1A 4WW, England, for tickets to see BBC radio and television shows in person. Also, check out the BBC's Ceefax system on your hotel's TV.

An electronic data service that piggy-backs on all four TV channels, Ceefax brings you an electronic newspaper that you read on your TV screen. Hundreds of pages long, it includes world and local news, a TV guide, the weather, and even technical help for better reception.

Famous offshore broadcaster, Radio Caroline, uses this system to get material for its newscasts. You can hear them quite clearly in London on 558 kHz. Besides the BBC, you can listen to a variety of independent commercial radio stations like Capital Radio on 98.5 FM and 1548 AM. And don't forget to send us a postcard!

BITS 'N' PIECES

According to *Broadcasting Magazine's* recently published 1989 Yearbook, the most popular format in the United States is country music. 2,325 radio stations play down home music regularly. Religious and gospel was second with 1,054 stations, followed by top 40 with 984 stations.

Speaking of numbers, there are 4,948 AM and 5,557 FM stations on the air in the U.S. If you add 1,689 AM translator/repeater stations and 1,593 stations currently with construction permits to be built, the total comes to a whopping 13,787 stations. How many have you heard?

The FCC has approved the adoption of the NRSC-2 RF emission standard. This is part of their drive to improve reception on the AM band.

Simply put, it acts like a mask that will limit AM signals from transmitting audio frequencies higher than 10 kHz to eliminate annoying splatter from stations on adjacent frequencies

to the one you're listening to. This standard will be mandatory for all AM stations starting June 30, 1990.

Renee Montagne, co-host of National Public Radio's "All Things Considered" will become a correspondent for NPR's national desk. After being with the show for nearly two years, she is going back to her first love — reporting.

You may have seen it on television, and now it's on radio, too. Movietime, the movie and entertainment news channel, has just launched The Movietime Radio Network. Joe Shults, Movietime's vice president of new business development, claims it will be heard by 75 percent of America by year's end.

And another three letter call sign is about to bite the dust. WOR, 710 AM, in

New York City, has been sold for 25.5 million dollars. The owner, RKO Broadcasting, is selling all its stations because the FCC ruled that RKO was an unfit licensee due to various illegal business practices.

Mailbag

Bruce Portzer of Seattle, Washington, echoes a question to us this month. He asks, "When I compare two stations carrying the same program, like The Larry King Show, I often hear a substantial delay between the two. If I listen to two radios, one on each frequency, the echo is deeper than the Grand Canyon's. Why does this happen?"

There are two reasons. Many stations tape the show when it actually is broadcast and play it back later in the evening. Although most stations will play back their tapes starting on the hour, or after their network news, they are often a few seconds apart from other stations playing back the same tape.

But the most common reason for a delay is the way the show gets to the station. If the show is received by high quality telephone lines and/or microwave, it only has to travel up to a couple of thousand miles to reach the station. If it comes in by satellite, it travels over 22,000 miles up and down from the relaying "bird" in the sky.

Even at the speed of light, it takes much longer to go 45,000 miles than 2,000 miles, and that's what creates the delay.

New Station Grants

Here's what you can expect in the future on AM: Buckley, Washington, will soon have a new station on 740 kHz. Soon to be heard on FM radios: Key Colony Beach, Florida, 105.5; Clyde, New York, 93.7; and Lancaster, Ohio, 103.5.



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OLD RADIOS, YOU NEED...**

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For Sale

This month you can buy a Class A FM in North Mississippi priced to sell for cash or terms. Write to: Box C-780, Cleveland, Mississippi 38732.

An Illinois Class A FM that is profitable in a large metro market is also available. It includes buildings, real estate, and good equipment. The owner must sell by July, and will accept the best cash offer over \$600,000. Contact the General Manager, P.O. Box 583, Wilmette, Illinois 60091.

Interested in AM? How about a 10 KW station in Kansas City. It has a low price with terms available, and state-of-the-art studios. Contact Rich Bott at 816-252-5050.

International Bandscan

Stations like WADU, near New Orleans, and WRFM-AM in Hialeah, Florida, both on 830 kHz, have almost given up night broadcasting. It has been heard in the daytime as far north as Massachusetts.

The Spanish government is finalizing a new set of allocations that will allow 11,200 new VHF stations to hit the air.

Radio Network Schweiz has just been formed in Switzerland. The RNS programs, originating in studios in Basel, will be fed to twelve local commercial stations throughout Switzerland.

A cold war has broken out in Europe. Radio Luxembourg and RTE, the Irish governmental broadcasting network are planning to call their new joint venture station Radio 5. It will be a daytime station aimed at Great Britain, broadcasting from Ireland. The BBC also recently announced that they will start a new radio service in 1990 also called Radio 5. Each party is asking the other one to cease and desist. My bet's on the BBC!

mt

Credits: John Zanzarella and Gary Theroux of WZFM, Briarcliff Manor, NY; *Radio World*, *Broadcast Engineering*, *Broadcast Management and Engineering*, *Broadcasting*, and *Billboard* magazines; and Bruce Portzer. Thank you.

Pirates, Pirates, Everywhere!

Judging from the contents of Box 1116 these days, everybody must be listening to pirates! And if everybody is listening, WJDI appears to be the station they are hearing most frequently. What makes WJDI reception so impressive is that with its frequency of 1620 kHz, it can claim to be a mediumwave station getting its signal out there without the benefit of the shortwaves.

For John Carlson of Massachusetts, WJDI was a very special catch. When it showed up at 0110 UTC, it was his first pirate ever logged. Pennsylvania's John Demmitt bagged WJDI with a strong signal and mild rock. In Virginia, Pat Murphy logged and QSLed them, and WJDI told Pat to look for the station Sunday at 11:00 p.m. Eastern Time and week days at 5:00 a.m. Another WJDI QSL went to Stanley

Mayo up in Maine.

In New York, Mark Henning not only received a WJDI QSL and studio photograph, but also a map indicating the locations where the signal had been received. The WJDI signal has made it as far west as Minnesota and as far north as New Brunswick. Virginia appears to be the southernmost point.

There is no better pirate verifier than WJDI. Reports can be sent to Box 142, Cottekill, New York 12419 for forwarding to the station. So far, generous replies have been received very promptly.

West Coast Action

Out on the west coast they're also hearing pirates! Washington's John Myers

wants us to know that. Furthermore, he can prove it. John logged Falling Star Radio on 6240 and also QSLed it. John heard the station KTRQ mentioned on Falling Star and wonders if anybody knows more about this one. The address for Falling Star Radio is Box 1659, Gracie Station, New York, New York 10028.

WKND is another pirate with quite an audience these days. The trouble is no one can contact it, since the station has been reluctant to establish any sort of address for mail.

However, Ohio's Tim Francisco has logged them twice on 6240 kHz around 0445 UTC. In Connecticut, Jim Kalach has heard them with a wide variety of music including rock, new wave, big band, classical, and blues. They also do commer-

RADIO WOODLAND INTERNATIONAL
(Broadcasting from a cave somewhere far north of the south pole)

This will confirm that Cathy Turner heard R W I on 7435 kHz
at 2335 - 0007 UTC(GMT) on 6-9-85.

THANK FOR LISTENING!

73's and F P F R
Jack in the Green
Jack-in-the-Green

SUCCESS IN RADIO IS BUILT
ON PERSONALITIES...

Zeppelin Radio Worldwide

Antenna: half-wave dipole

Power: 120 watts

Date: 6-9-85 Time: 0155 UTC

Frequency: 1735.12 kHz

ZRM

Condit Wolfgang von Manteuffel

ZRM QSL ZRM

Everyone must be hearing pirates these days! Here are a few pirate QSLs from the collection of Cathy Turner.

BUGGED???

Find Hidden radio transmitters (bugs) in your home, office or car. The TD-17 is designed to locate the most common type of electronic bug - the miniaturized radio transmitter - which can be planted by anyone, almost anywhere.

The TD-17 warns of the presence of nearby RF transmitters, within the frequency range of 1 MHz to 1,000 MHz, when the RF ALERT LED turns on. The flashing RANGE LED and audio tone give an indication of the distance to the bug. The SENSITIVITY control, used in conjunction with the two LEDs helps you quickly zero in on hidden bugs.

The hand-held TD-17 weighs less than 7 oz. and is housed in a high-impact plastic case. Furnished complete with battery, antenna, instruction manual and one year Limited Warranty. Save \$100 to \$200 and order at our factory direct price of only \$98 + \$2 shipping. Satisfaction guaranteed or your money back. Catalog \$1 or FREE with order.



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cial and public service announcement spoofs.

In New York, Jim Hayes heard WKND cryptically claim their address was in "the eighth issue of a communications magazine." WKND's address is also in *this* issue of a communications magazine. In fact, Harold Fodge got a QSL from them in 59 days for an SASE. Check out Gayle Van Horn's QSL column on page 46 for the exact address.

RADIO USA is a station that was active several years ago when pirate activity was at a peak. Then it, like many others, went silent. Now Radio USA appears to be back. Fraser Bonnett heard them in Ohio on 7415 at 2208 UTC and claiming to be broadcasting in *triple* sideband. Well, if they will just explain to us how they do that, we can write them into somebody's record book.

Jim Hayes also logged the station with a DX show and a contest offering Radio USA T-shirts. Pat Murphy was yet another reader monitoring Radio USA and notes their address is Box 5074, Hilo, Hawaii 96720.

UNITED WORLD RADIO is one of the more unusual pirates around these days. Jim Hayes also logged this one. It seems to favor late 1960s to early 1970s music and commentary with something of a 1960s flavor.

Pat Murphy heard the station commenting on a nuclear accident. New Jersey's Ray Babecki heard anti-apartheid commentary and a plea to save the whales. Look for this one around 7415 kHz at about 2330. The address is United World Radio, c/o Tagar, Room 258, Union Building, Stony Brook, New York 11794. Ray notes there is a campus of the State University of New York in Stony Brook.

WENJ still manages to be heard. Ray found them on 7415 at 2100. Announcer Jack Beane said they also use 6240, 6250, and 7480 kiloHertz. Fraser Bonnett also found WENJ on 7415. They use the Hilo maildrop mentioned above.

There you have a rundown on the pirates that "Outer Limits" readers have encountered recently. In addition, there were several intriguing unidentifiables

including one on 7418 Fraser heard with a discussion of thyroid glands!

So you can see there is plenty to be heard out there. Readers sometimes write saying they have tried and tried and cannot log a pirate. Don't be discouraged. Hang in there, and most likely your efforts will eventually be rewarded.

FM Pirate:

Loren and Marcy Frumker sent along information about a FM pirate that had been operating out of the Cleveland area in South Euclid, Ohio. The station was WKEY on 87.9 MHz.

Operator Edward DeGeorge, Jr. was using an army surplus transmitter and 40 watts to broadcast rock and roll after failing to get a job with a local licensed station. However, the Frumkers report the station is no longer on the air. It seems the FCC was one of the listeners DeGeorge attracted to WKEY.

Clandestine, You Say!

Fraser Bonnett came across anti-Castro La Voz de Alpha 66 appropriately enough on the frequency of 6666 kHz. It signed off at 0134 UTC. The Voice of Alpha 66 is one of the oldest of the anti-Castro broadcasters and is operated by the Cuban exile group Alpha 66, which dates back to the days of the first refugees leaving Castro's Cuba for Florida.

It is not easy to verify, but you can try P.O. Box 420067, Miami, Florida 33142. If

you possibly can, try to write your report in Spanish.

Northern Ireland

Our Europirate DXpert, Gregg Bares, of Connecticut, advises us that a new pirate in Northern Ireland is now testing to North America. The station is Triangle Nighttime Radio, and its frequency is 6273. The schedule is 0200 to 0500 UTC Sundays. Readers in the United Kingdom and Ireland may also want to try the FM frequency of 98.5 MHz.

The station address is The Strand Hotel, Strand Road, Portstewart, County Londonderry, Northern Ireland.

We also have some excellent news on the pirate scene in England and offshore. However, due to this month's heavy volume of mail we will hold that until next time.

A Special Hello

...to the gang at the CIA's Camp Perry. Thanks for the kind words, guys. And to all our readers everywhere, much thanks for your many contributions, your encouragement, and suggestions. You are all deeply appreciated.

Dr. John Santosuosso will be speaking at the 1989 ANARC convention July 14-17. For more information write to ANARCON, P.O. Box 272301, Tampa, Florida 33688.

mt

The LF Set-up

For some time I have been writing about things that can be heard below 500 kHz. Several readers have written in to say, "Fine and dandy, but how do I go about being able to hear anything down low? What kind of receiver do I need? Antenna? etc." Sometimes the things that are most obvious to us are overlooked when telling someone else about the hobby.

Receivers

Let's start with the receiver. This isn't a problem with most of the general coverage receivers being sold today. Most include the longwaves as part of the spectrum. Notice the specifications for the receivers listed in your catalogs. The low end of the frequency range will probably be from around 150 kHz to 200 kHz. Some will go as low as 90 or 100 kHz. This is the practical limit.

Receivers for the very low frequencies are a completely different world. If the low frequencies from 150 to 500 kHz are a kind of half brother to high frequency listening, the very low frequencies are a very distant cousin, many times removed. For this reason, the very low frequencies will be left for another discussion at some later date.

If your receiver is from a fairly recent year, you should be able to find a low frequency segment on it. You can check by turning the receiver on and listening to the frequencies between 200 and 400 kHz. You should hear some Morse code coming through slowly and repeating itself after every two or three letters. Wherever you are, there should be a few beacons close enough to be heard easily.

Whether the low end of the frequency range is 100 kHz or 150 kHz is a moot point because so few transmissions exist in the frequencies between. The GWEN stations may be heard between 150 kHz and 175 kHz. These sound like heavy breathing or coughs, actually being data bursts of a few seconds duration each.

The current schedule seems to be a longer series of bursts (about one minute in duration) every 20 minutes. There are shorter bursts (a few seconds in duration) about three minutes apart during the interval between the long bursts.

Try the GWEN stations and the beacons to test the operation of the low frequency band on your receiver.

Even if your receiver doesn't have a low frequency range, all is not lost. You can purchase a converter that will move the low frequency band to a location within your receiver's range. This is usually around the 4 MHz area. Then follow all the other suggestions for setting up a low frequency listening post. Hook in a converter and your receiver is now able to tune within the low frequency band by using the controls you would normally use with the assigned 4 MHz range.

Antennas

The next step is the antenna. There are a variety of antennas that can and do work for low frequency DXing. As the low frequency logging editor for a radio club, I receive reports from a number of people in many locations. They use all kinds of different antennas and often with great results.

The best may be a long wire. Only here we are talking about a L-O-N-G wire. These are long wires of 3000 or 4000 foot length. In the low frequencies, a quarter-wave-length antenna is long.

If you are using a portable receiver, you probably already have a loop antenna built in. These work beautifully. Radio signals in long wave are very directional, like medium wave broadcast stations, only more so.

A loop antenna can increase the signal strength in one direction while nulling the signals from the perpendicular direction. This is very helpful in the beacon band where multiple beacons on a single frequency are the rule rather than the exception. Try rotating your portable receiver to get the feel of the effect it has on low frequency signals.

There are loop antennas available in the market place and there are plans for building your own. Both are good and can do wonders for your DXing. If you are all thumbs like I am, you should probably buy one. If you are skilled, you can get a plan and build your own.

I have also heard of very good results with long wires of 100 feet or a little less. One DXer tested an active indoor antenna with great results on low frequency beacons. There does not appear to be any single answer which indicates that the best antenna may by yet to come when someone finds that ideal design.

What this all means is that for many of you the necessary equipment is already in your shack. All you have to do is view it a little bit differently.

Follow up:

Last month I mentioned that the Canadian Coast Guard is indeed still operating with CW below 435 kHz. The latest edition of the ADXR bulletin listed a schedule for Canadian coastal stations. This was drawn from the 1988 edition ITU list and submitted by Ari Mononen of Finland. I've extracted the frequencies and times for the CW portion below 500 kHz for your reference.

mt

Canadian Coastal LF Stations

LOCATION	CALL	FREQ	GMT
Coral Harbor	VFU	416	0210 1350
Labrador	VOK	416	+20 2/8/14/20
Prince Rupert	VAJ	420	+20 08/11/20
Churchill	VAP	420	+30 02/14
Montreal	VFN	420	+10 00/13/15
Victoria	VAK	430	+20 09/13/21
Frobisher Bay	VFF	430	1430 2000
Riviere-au-Renard	VCG	434	+50 00/13/15
Mont Joli	VCF	446	+30 00/13/15
Sydney	VCO	464	0130 1220 2140
Quebec	VCC	474	+20 00/13/15
Resolute	VFR	474	+20 01/13
Tofino	VAE	478	+20 08/12/20
St. John's	VON	478	0000 0920 2130
Bull Harbour	VAG	484	+48 08/12/20
Halifax	VCS	484	+00 01/12/21
Frobisher Bay	VFF	484	1430 2000
Yarmouth	VAU	489	+30 03/12/21
St. Anthony	VCM	489	0210 1305 17/21

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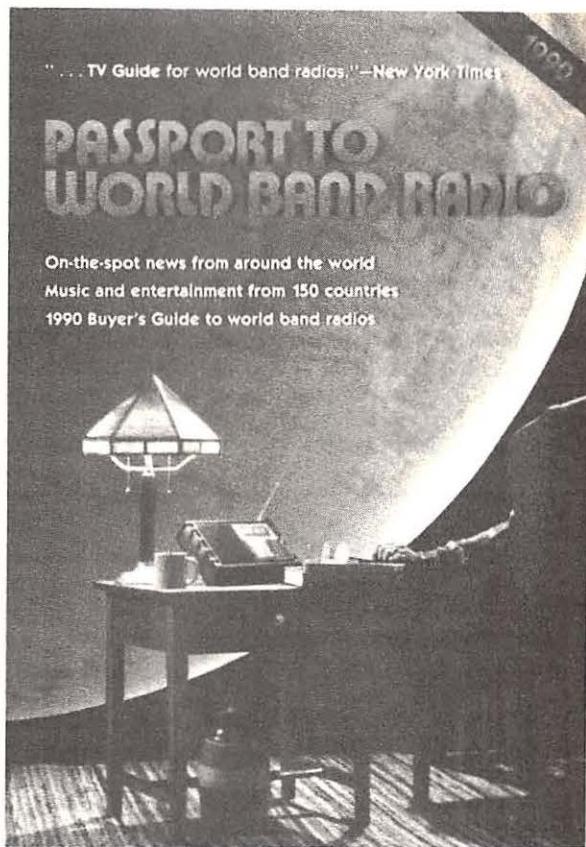
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program



Sunday

July 2, 9, 16, 23, 30

- 0010 Voice of America (Americas, Caribbean): American Viewpoints. Experts discuss provocative magazine and newspaper articles.
- 0010 Voice of America (East Asia): Newsline. News, correspondent reports, interviews, and opinion.
- 0030 BBC: Composer of the Month. Profiles and music of famous composers.
- 0030 Radio Australia: Anything Goes. John Anderson with a musical smorgasbord.
- 0030 Voice of America (Caribbean): Weekend Magazine. Music, conversations with correspondents, and talks about the arts.
- 0040 Voice of America (Americas, East Asia): Words and Their Stories (Special English). A feature program in s-l-o-w English.
- 0045 Voice of America (Americas): American Stories (Special English). More features in s-l-o-w English.
- 0045 Voice of America (East Asia): VOA Morning. Sports, science, business, music, and features about America.
- 0101 BBC: Play of the Week. Hour-long drama selections.
- 0110 Voice of America (Americas, Caribbean): Communications World. A look at modern telecommunications.



The anchor team of the *World Service of the Christian Science Monitor* (KYOI, WCSN, and WSHB): left to right, the anchors are Don Singh, Lisa Taylor, Schuyler Sackett, Kim Shippey, and Sydney Glover.

LEGEND

- * The first four digits of an entry are the program start time in UTC.
- * The time is followed by the station name, program name, and a brief summary of the program's content.
- * Some listings may be followed by "See X 0000." The letter stands for a day of the week:

S=Sunday	M=Monday
T=Tuesday	W=Wednesday
H=Thursday	F=Friday
A=Saturday	

The four digits stand for a time in UTC. Listeners should check back to that date and time to find out more about that particular program.

- * All broadcasts are listed in chronological order, starting on Sunday at 0000 UTC and ending on Saturday at 2359 UTC.
- * All days are in UTC. Remember that if you are listening in North

MT Program Team

Kannon Shanmugam, Program Manager

4412 Turnberry Drive
Lawrence, KS 66046

Jim Frimmel, TX

Dale Vanderpoel, FL

- 0110 Voice of America (South Asia): Newsline. See S 0010.
- 0113 Radio Australia: Boomerang. Answers to listener inquiries about Radio Australia.
- 0130 Radio Australia: At Your Request. Dick Paterson plays listener requests.
- 0130 Voice of America (Americas, Caribbean) Press Conference, U.S.A. Correspondents ask questions of newsmakers.
- 0130 Voice of America (South Asia): VOA Morning. See S 0045.
- 0209 BBC: British Press Review. Survey of editorial opinion in the British press.
- 0210 Voice of America (South Asia): Newsline. See S 0010.
- 0215 BBC: Reading. A serialized story or novel, as adapted for radio.
- 0230 BBC: The Ken Bruce Show. A mix of popular music and entertainment news.
- 0230 Radio Australia: Communicator, Report on developments in the communications world.
- 0230 Voice of America (South Asia): VOA Morning. See S 0045.
- 0310 Voice of America: VOA Morning. See S 0045.
- 0313 Radio Australia: Music of Radio Australia. Selections by Radio Australia announcers.
- 0315 BBC: From Our Own Correspondent. In-depth news stories from correspondents worldwide.
- 0330 BBC: My Word! A quiz show filled with questions about - you guessed it - words.
- 0330 Radio Australia: Unsung Heroes and Heroines. A look at extraordinary but little-known Australians.
- 0345 Radio Australia: Music of Radio Australia. See S 0313.
- 0410 Voice of America: VOA Morning. See S 0045.
- 0430 BBC: Stuart Colman's Record Hop. Classic and contemporary rock and roll.
- 0430 Radio Australia: Arts Roundabout. Arts in Australia, past and present.
- 0445 BBC: Worldbrief. A 15-minute roundup of the week's news headlines and other events.
- 0509 BBC: Twenty-Four Hours. Analysis of the main news of the day.
- 0510 Voice of America: VOA Morning. See S 0045.
- 0513 Radio Australia: Music of Radio Australia. See S 0313.
- 0530 BBC: Financial Review. A look back at the financial week.
- 0530 Radio Australia: At Your Request. See S 0130.
- 0540 BBC: Words of Faith. People share how their scripture gives meaning to their lives.
- 0545 BBC: Letter from America. Alistair Cooke's distinctly British view of America.
- 0610 Voice of America: VOA Morning. See S 0045.
- 0630 BBC: Jazz for the Asking. A jazz music request show.
- 0630 Radio Australia: Feature Series. A series of topical feature programs.
- 0709 BBC: Twenty-Four Hours. See S 0509.
- 0713 Radio Australia: You Asked for It. Listener questions about Australia.
- 0730 BBC: From Our Own Correspondent. See S 0315.
- 0730 Radio Australia: Communicator. See S 0230.
- 0745 BBC: Book Choice. Short reviews of current or future best-sellers.
- 0750 BBC: Waveguide. How to hear the BBC better.
- 1110 Voice of America (Caribbean): Critic's Choice. News from the world of the arts.
- 1110 Voice of America (East Asia): New Horizons. The world of science, medicine, and technology.
- 1113 Radio Australia: Music of Radio Australia. See S 0313.
- 1115 BBC: From Our Own Correspondent. See S 0315.
- 1130 BBC: Composer of the Month. See S 0030.
- 1130 Radio Australia: International Top Hits. John Anderson with the week's big sounds.
- 1130 Voice of America (Caribbean): Studio One. Dramatized and narrative documentaries.
- 1130 Voice of America (East Asia): Issues in the News. Members of the Washington press corps discuss current topics.
- 1201 BBC: Play of the Week. See S 101.
- 1210 Voice of America: Encounter. A discussion program presenting opinions on world issues.
- 1230 Radio Australia: Communicator. See S 0230.
- 1230 Voice of America: Studio One. See S 1130.
- 1309 BBC: Twenty-Four Hours. See S 0509.
- 1310 Voice of America: Critic's Choice. News from the world of the arts.
- 1313 Radio Australia: Smith's Weekly. Keith Smith's potpourri of news and views.
- 1330 BBC: Sports Roundup. Day's sports news.

American prime time, it is actually the next morning UTC. For example, if you are listening to a program at 8:01 pm [EDT] on your Thursday night, that's equal to 0001 UTC and therefore Friday morning UTC.

We suggest that you tune in to a program a few minutes before the schedule start time, as some stations have tentative schedules which may slightly vary. We invite listeners and stations to send program information to the program manager at the address above.

program

guide

- 1330 Radio Australia: Sports Results. Reports from Australian and international sporting events.
 1340 Voice of America: Words and Their Stories (Special English). See S 0040.
 1345 BBC: Worldbrief. See S 0445.
 1345 Radio Australia: Music of Radio Australia. See S 0313.
 1345 Voice of America: People in America (Special English). A feature program in s-l-o-w English.
 1401 BBC: Feature. Programming on various subjects.
 1410 Voice of America: The Concert Hall. Classical music and interviews with America's great artists and conductors.
 1430 BBC: Anything Goes. Sounds from the BBC archives as requested by listeners.
 1430 Radio Australia: Innovations. Australian inventions, innovative practices and processes.
 1455 Voice of America: Editorial. American opinion.
 1510 Voice of America: New Horizons. See S 1110.
 1513 Radio Australia: Music of Radio Australia. See S 0313.
 1515 BBC: Concert Hall. A program of classical music from the world's great concert halls.
 1530 Radio Australia: Matters of Faith. Doctrines and beliefs of the Pacific basin.
 1530 Voice of America: Studio One. See S 1130.
 1610 Voice of America (Africa): Nightline Africa. News and reports on world and African issues.
 1610 Voice of America: Encounter. See S 1210.
 1615 BBC: Feature. Programming on various subjects.
 1630 Radio Australia: Music of Radio Australia. See S 0313.
 1640 Voice of America: Words and Their Stories (Special English). See S 0040.
 1645 BBC: Letter from America. See S 0545.
 1645 Radio Australia: Sports Results. See S 1330.
 1645 Voice of America: People In America (Special English). See S 1345.
 2309 BBC: Book Choice. See S 0745.
 2310 Voice of America: Newsline. See S 0010.
 2313 Radio Australia: Music of Radio Australia. See S 0313.
 2315 BBC: Letter from America. See S 0545.
 2330 BBC: Feature. See S 1615.
 2330 Radio Australia: Monitor. News about scientific, medical, and technological developments.
 2330 Voice of America: VOA Morning. See S 0045.

Monday

July 3, 10, 17, 24, 31

- 0010 Voice of America (Americas, Caribbean): Encounter. See S 1210.
 0010 Voice of America (East Asia): Newsline. See S 0010.
 0030 BBC: In Praise of God. A half-hour program of worship.
 0030 Radio Australia: Music of Radio Australia. See S 0313.
 0030 Voice of America (Americas, Caribbean): Spotlight. Reports and interviews on people, places, and events of interest to listeners in the Caribbean and Latin America.
 0040 Voice of America (East Asia): Words and Their Stories (Special English). See S 0040.
 0045 Voice of America (East Asia): VOA Morning. See S 0045.
 0101 BBC: Opera of the Week. An introduction to opera, with excerpts from several operas.
 0110 Voice of America (Americas, Caribbean): New Horizons. See S 1110.
 0110 Voice of America (South Asia): Newsline. See S 0010.
 0113 Radio Australia: Window on Australia. A look at people and places all over the nation.
 0130 Radio Australia: This Australia. Documentaries about the land "down under".
 0130 Voice of America (Americas, Caribbean): Issues in the News. See S 1130.
 0130 Voice of America (South Asia): VOA Morning. See S 0045.
 0145 BBC: Musical Feature. Programming on various musical topics.
 0209 BBC: British Press Review. See S 0209.
 0210 Voice of America (South Asia): Newsline. See S 0010.
 0215 BBC: Andy Kershaw's World of Music. Exotic and innovative music from the world over.
 0230 BBC: Science In Action. The latest in scientific developments.
 0230 Radio Australia: International Country Music. The latest country chart makers and top albums.
 0230 Voice of America (South Asia): VOA Morning. See S 0045.
 0310 Voice of America: Daybreak Africa. Correspondent reports, news features, and background reports.
 0313 Radio Australia: Music of Radio Australia. See S 0313.
 0315 BBC: Good Books. A recommendation of a book to read.
 0330 BBC: Anything Goes. See S 1430.

- 0330 Radio Australia: Sports Results. See S 1330.
 0345 Radio Australia: Music of Radio Australia. See S 0313.
 0410 Voice of America: Newsline. See S 0010.
 0425 Radio Australia: Propagation Report. Mike Bird with the shortwave weather report.
 0430 BBC: Reading. A serialized story or novel, as adapted for radio.
 0430 Radio Australia: AgriNews. News and information about agricultural and primary industries.
 0430 Voice of America: VOA Morning. See S 0045.
 0445 BBC: Nature Now. Information about flora, fauna, and natural resources.
 0445 Radio Australia: Music of Radio Australia. See S 0313.
 0509 BBC: Twenty-Four Hours. See S 0509.
 0510 Voice of America: Newsline. See S 0010.
 0513 Radio Australia: Music of Radio Australia. See S 0313.
 0530 BBC: Waveguide. See S 0750.
 0530 Voice of America: VOA Morning. See S 0045.
 0533 Radio Australia: Window on Australia. See M 0113.
 0540 BBC: Words of Faith. See S 0540.
 0545 BBC: Recording of the Week. A personal choice from the latest classical music releases.
 0610 Voice of America (Africa): Daybreak Africa. See M 0310.
 0610 Voice of America: Newsline. See S 0010.
 0630 BBC: Feature. See S 1401.
 0630 Radio Australia: Australian Country Style. Local country music from Australia.
 0630 Voice of America: VOA Morning. See S 0045.
 0709 BBC: Twenty-Four Hours. See S 0509.
 0713 Radio Australia: Pacific Sunrise. Business and



Vatican Radio's "Talking Point," which features roundtable discussions galore, can be heard on Tuesdays.

NEWS GUIDE

This is your guide to news broadcasts on the air. All broadcasts are daily unless otherwise noted by brackets. These brackets enclose day codes denoting days of broadcast. The codes are as follows:

S= Sunday M= Monday
 T= Tuesday W= Wednesday
 H= Thursday F= Friday
 A= Saturday

We invite listeners and stations to send program information to the program manager.

- 0000 BBC: Newsdesk
 0000 Kol Israel: News
 0000 KVOH: UPI Radio News
 0000 KYOI: News [M-F]
 0000 Radio Australia: International Report
 0000 Radio Beijing: News
 0000 Radio Canada Int'l: News [S-M]
 0000 Radio Moscow: News
 0000 Spanish National Radio: News
 0000 Voice of America: News
 0000 WCSN: News [T-F]
 0010 Radio Beijing: News About China
 0030 KVOH: UPI Headline News
 0030 Radio Kiev: News
 0030 Radio Moscow (World Service): News in Brief
 0030 Radio Netherlands: News [T-S]
 0030 Voice of America (Special English): News
- 0030 WCSN: News [T-F]
 0045 Radio Berlin Int'l: News
 0051 Spanish National Radio: News Summary [S]
 0100 BBC: News Summary
 0100 Deutsche Welle: World News
 0100 Kol Israel: News
 0100 KVOH: UPI Radio News [T-A]
 0100 KYOI: News [M-F]
 0100 Radio Australia: World and Australian News
 0100 Radio Berlin Int'l: News
 0100 Radio Canada Int'l: News [S-M]
 0100 Radio Japan: News [M-A]
 0100 Radio Moscow: News
 0100 Radio Prague: News
 0100 Radiotelevisione Italiana: News
 0100 Spanish National Radio: News
 0100 Voice of America: News
 0100 WCSN: News [T-F]
 0130 KVOH: UPI Headline News [T-A]

program

guide

- export developments in the Pacific.
 0730 BBC: Feature. See S 1615.
 1110 Voice of America (Caribbean): Focus. A look at the major figures and issues that shape contemporary life.
 1110 Voice of America: Science Report (Special English). A feature program in s-l-o-w English.
 1113 Radio Australia: Window on Australia. See M 0113.
 1115 BBC: Tech Talk. What's new in the world of engineering.
 1115 Voice of America: This is America (Special English). More features in s-l-o-w English.
 1130 BBC: The Ken Bruce Show. See S 0230.
 1130 Radio Australia: Music of Radio Australia. See S 0313.
 1130 Voice of America (Caribbean): VOA Morning. See S 0045.
 1130 Voice of America: Music, U.S.A. (Standards). Classics of American popular music.
 1210 Voice of America: Newsline. See S 0010.
 1215 BBC: Brain of Britain. THE general-knowledge quiz show of all time, a must listen.
 1225 Radio Australia: Propagation Report. See M 0425.
 1230 Radio Australia: Feature Series. See S 0630.
 1230 Voice of America: Magazine Show. Features about culture, science, sports, medicine, and the arts in America.



Marina Dymova, Vasily Strelnikov and Svetlana Yekimenko present a program on Radio Moscow's World Service in English.

- 1245 BBC: Sports Roundup. See S 1330.
 1309 BBC: Twenty-Four Hours. See S 0509.
 1310 Voice of America: Focus. See M 1110.
 1313 Radio Australia: Music of Radio Australia. See S 0313.
 1330 BBC: Good Books. See M 0315.
 1330 Radio Australia: Sports Results. See S 1330.
 1340 Voice of America: Science Report (Special English). See M 1110.
 1345 BBC: Recording of the Week. See M 0545.
 1345 Radio Australia: Book Readings. Serialized readings from popular books.
 1345 Voice of America: This is America (Special English). See M 1115.
 1405 BBC: Outlook. An excellent magazine (i.e., covering everything!) program.
 1410 Voice of America: Asia Report. News, correspondent reports, interviews, and opinion.
 1425 Radio Australia: Stock Exchange Report. Financial news from the Pacific.
 1430 Radio Australia: Window on Australia. See M 0113.
 1445 BBC: Reading. See S 0215.
 1455 Voice of America: Editorial. See S 1455.
 1510 Voice of America: Newsline. See S 0010.
 1513 Radio Australia: Music of Radio Australia. See S 0313.
 1515 BBC: Opera of the Week. See M 0101.
 1530 Radio Australia: Monitor. See S 2330.
 1530 Voice of America: Magazine Show. See M 1230.
 1610 Voice of America (Africa): Nightline Africa (until 1700). See S 1610.
 1610 Voice of America: Focus. See M 1110.
 1615 BBC: Reading. See M 0430.
 1625 Radio Australia: Stock Exchange Report. See M 1425.
 1627 Radio Australia: Propagation Report. See M 0425.
 1630 BBC: Tech Talk. See M 1115.
 1630 Radio Australia: Music of Radio Australia. See S 0313.
 1640 Voice of America: Science Report (Special English). See M 1110.
 1645 BBC: The World Today. News analysis on a selected location or event in the news.
 1645 Radio Australia: Sports Results. See S 1330.
 1645 Voice of America: This is America (Special English). See M 1115.
 2309 BBC: Commentary. Background to the news from a wide range of specialists.
 2310 Voice of America: Newsline. See S 0010.
 2313 Radio Australia: Music of Radio Australia. See S 0313.
 2315 BBC: Feature. Programming on various

- subjects.
 2330 BBC: Multitrack 1: Top 20. What's hot on the British pop music charts.
 2330 Radio Australia: Arts Roundabout. See S 0430.
 2330 Voice of America: VOA Morning. See S 0045.

Tuesday

July 4, 11, 18, 25

- 0010 Voice of America (Americas): Newsline. See S 0010.
 0010 Voice of America (Caribbean): Caribbean Report. The latest news, sports, financial news, and weather reports for the Caribbean.
 0010 Voice of America (East Asia): Newsline. See S 0010.
 0030 BBC: Megamix. A compendium of music, sport, fashion, health, travel, news and views for young people.
 0030 Radio Australia: Music of Radio Australia. See S 0313.
 0030 Voice of America (Caribbean): Music, U.S.A. (Standards). See M 1130.
 0040 Voice of America (Americas, East Asia): Science Report (Special English). See M 1110.
 0045 Voice of America (Americas): This Is America (Special English). See M 1115.
 0045 Voice of America (East Asia): VOA Morning. See S 0045.
 0101 BBC: Outlook. See M 1405.
 0110 Voice of America (Americas, Caribbean): Report to the Americas. News, correspondent reports, interviews, and opinion.
 0110 Voice of America (South Asia): Newsline. See S 0010.
 0113 Radio Australia: Window on Australia. See M 0113.
 0125 BBC: Financial News. News of commodity prices and significant moves in currency and stock markets.
 0130 BBC: Short Story. Brief tales written by BBC listeners.
 0130 Radio Australia: Feature Series. See S 0630.
 0130 Voice of America (South Asia): VOA Morning. See S 0045.
 0145 BBC: Europe's World. A magazine program reflecting life in Europe and its link with other parts of the world.
 0155 Voice of America (Americas, Caribbean): Editorial.
 0209 BBC: British Press Review. See S 0209.
 0210 Voice of America (Americas, Caribbean): Focus.

news guide cont'd from p.57

- 0130 Radio Moscow (World Service): News in Brief [S-M]
 0130 WCSN: News [T-F]
 0149 Radio Veritas Asia: World News [M-F]
 0150 HCJB: News [T-A]
 0151 Spanish National Radio: News Summary [S]
 0152 Radio Veritas Asia: World News [A]
 0153 Radio Prague: News Wrap-Up
 0155 HCJB: News [S]
 0200 BBC: World News
 0200 Deutsche Welle: World News
 0200 HCJB: News [M]
 0200 KVOH: UPI Radio News [T-A]
 0200 KYOI: News [M-F]
 0200 Radio Australia: International Report
 0200 Radio Berlin Int'l: News
 0200 Radio Canada Int'l: As It Happens [T-A]
 0200 Radio Moscow: News

- 0200 Radio RSA: News
 0200 Swiss Radio Int'l: News
 0200 Voice of America: News
 0200 Voice of Free China: News and Commentary
 0200 WCSN: News [T-F]
 0215 Radio Cairo: News
 0230 KVOH: UPI Headline News [T-A]
 0230 Radio Finland: Northern Report [T-A]
 0230 Radio Moscow (World Service): News in Brief [S]
 0230 Radio Portugal: News [T-A]
 0230 WCSN: News [T-F]
 0245 Radio Berlin Int'l: News
 0300 BBC: World News
 0300 Deutsche Welle: World News
 0300 HCJB: News [T-A]
 0300 KVOH: UPI Radio News [T-A]
 0300 KYOI: News [M-F]
 0300 Radio Australia: World and Australian News
 0300 Radio Beijing: News

- 0300 Radio Berlin Int'l: News
 0300 Radio Canada Int'l: News [M-F]
 0300 Radio for Peace Int'l: News [T-A]
 0300 Radio Japan: News [M-A]
 0300 Radio Moscow: News
 0300 Radio Prague: News
 0300 Voice of America: News
 0300 Voice of Free China: News and Commentary
 0300 WCSN: News [T-F]
 0309 BBC: News About Britain
 0310 Radio Beijing: News About China
 0315 Radio Cairo: News
 0330 KVOH: UPI Headline News [T-A]
 0330 Radio Moscow (World Service): News in Brief [S-M]
 0330 Radio Netherlands: News [T-S]
 0330 WCSN: News [T-F]
 0350 Radiotelevisione Italiana: News
 0353 Radio Prague: News Wrap-Up
 0400 BBC: Newsdesk
 0400 Deutsche Welle: World News

program

guide



Dwayne Hollingsworth, program presenter at KNLS in Anchor Point, Alaska.

- 0210 Voice of America (South Asia): Newsline. See S 0010.
- 0215 BBC: Network UK. A look at the issues and events that affect the lives of people throughout the UK.
- 0230 BBC: Sports International. Feature program on a topic or person making sports headlines.
- 0230 Radio Australia: Taim Bilong Masta. Australia's involvement with Papua New Guinea over the last 100 years.
- 0230 Voice of America (South Asia): VOA Morning. See S 0045.
- 0310 Voice of America: Daybreak Africa. See M 0310.
- 0313 Radio Australia: Music of Radio Australia. See S 0313.
- 0315 BBC: The World Today. See M 1645.
- 0330 BBC: John Peel. Tracks from newly released albums and singles from the contemporary music scene.
- 0330 Radio Australia: Sports Results. See S 1330.
- 0345 Radio Australia: Music of Radio Australia. See S 0313

- 0410 Voice of America: Newsline. See S 0010.
- 0425 Radio Australia: Propogation Report. See M 0425.
- 0430 BBC: Feature. See M 2315.
- 0430 Radio Australia: Business Horizons. Business and trade in Australia and neighboring regions.
- 0430 Voice of America: VOA Morning. See S 0045.
- 0445 BBC: New Ideas. A radio shop window for new products and inventions.
- 0445 Radio Australia: Music of Radio Australia. See S 0313.
- 0445 BBC: Book Choice. See S 0745.
- 0509 BBC: Twenty-Four Hours. See S 0509.
- 0510 Voice of America: Newsline. See S 0010.
- 0513 Radio Australia: Music of Radio Australia. See S 0313.
- 0530 BBC: Financial News. See T 0125.
- 0530 Voice of America: VOA Morning. See S 0045.
- 0533 Radio Australia: Window on Australia. See M 0113.
- 0540 BBC: Words of Faith. See S 0540.
- 0545 BBC: The World Today. See M 1645.
- 0610 Voice of America (Africa): Daybreak Africa. See M 0310.
- 0610 Voice of America: Newsline. See S 0010.
- 0630 BBC: Counterpoint. The best in blues, jazz, and pop music, and talks with the performers who create it.
- 0630 Radio Australia: Monitor. See S 2330.
- 0630 Voice of America: VOA Morning. See S 0045.
- 0709 BBC: Twenty-Four Hours. See S 0509.
- 0713 Radio Australia: Music of Radio Australia. See S 0313.
- 0730 BBC: Europe's World. See T 0145.
- 0745 BBC: Network UK. See T 0215.
- 1110 Voice of America (Caribbean): Focus. See M 1110.
- 1110 Voice of America: Agriculture Report (Special English). A feature program in s-l-o-w English.
- 1113 Radio Australia: Window on Australia. See M 0113.
- 1115 BBC: Waveguide. See S 0750.
- 1115 Voice of America: Science in the News (Special English). More features in s-l-o-w English.
- 1125 BBC: Book Choice. See S 0745.
- 1130 BBC: Megamix. See T 0030.
- 1130 Radio Australia: Soundabout. Contemporary music for young people, with interviews and features.
- 1130 Voice of America (Caribbean): VOA Morning. See S 0045.
- 1130 Voice of America: Now Music. U.S.A. Rock and soul music from old favorites to the latest hits, and profiles of the stars.
- 1210 Voice of America: Newsline. See S 0010.
- 1215 BBC: Multitrack 1: Top 20. See M 2330.
- 1225 Radio Australia: Propagation Report. See M 0425.
- 1230 Radio Australia: Unsung Heroes and Heroines. See S 0330.
- 1230 Voice of America: Magazine Show. See M 1230.
- 1245 BBC: Sports Roundup. See S 1330.
- 1309 BBC: Twenty-Four Hours. See S 0509.
- 1310 Voice of America: Focus. See M 1110.
- 1313 Radio Australia: Music of Radio Australia. See S 0313.
- 1330 BBC: Network UK. See T 0215.
- 1330 Radio Australia: Sports Results. See S 1330.
- 1340 Voice of America: Agriculture Report (Special English). See T 1110.
- 1345 BBC: Stuart Colman's Record Hop. See S 0430.
- 1345 Radio Australia: Music of Radio Australia. See S 0313.
- 1345 Voice of America: Science in the News (Special English). See T 1115.
- 1405 BBC: Outlook. See M 1405.
- 1410 Voice of America: Asia Report. See M 1410.
- 1425 Radio Australia: Stock Exchange Report. See M 1425.
- 1430 Radio Australia: Window on Australia. See M 0113.
- 1445 BBC: Musical Feature. See M 0145.
- 1455 Voice of America: Editorial. See S 1455.
- 1510 Voice of America: Newsline. See S 0010.
- 1513 Radio Australia: Music of Radio Australia. See S 0313.
- 1515 BBC: A Jolly Good Show. Dave Lee Travis presents your record requests and dedications in his own unique way, including the Album of the Month.
- 1530 Radio Australia: Try to Remember. A musical portrait of the last 50 years.
- 1530 Voice of America: Magazine Show. See M 1230.
- 1610 Voice of America (Africa): Nightline Africa (until 1700). See S 1610.
- 1610 Voice of America: Focus. See M 1110.
- 1615 BBC: Omnibus. A half-hour program on practically any topic.
- 1625 Radio Australia: Stock Exchange Report. See M 1425.
- 1627 Radio Australia: Propagation Report. See M 0425.
- 1630 Radio Australia: Music of Radio Australia. See S 0313.
- 1640 Voice of America: Agriculture Report (Special English). See T 1110.

- 0400 HCJB: News [M-A]
- 0400 Kol Israel: News
- 0400 KYOI: News [M-F]
- 0400 Radio Australia: International Report
- 0400 Radio Beijing: News
- 0400 Radio Berlin Int'l: News
- 0400 Radio Canada Int'l: News [M-F]
- 0400 Radio Havana Cuba: International News
- 0400 Radio Moscow: News
- 0400 Radio RSA: News
- 0400 Swiss Radio Int'l: News
- 0400 Voice of America: News
- 0400 WCSN: News [M-F]
- 0410 Radio Beijing: News About China
- 0425 Radiotelevisione Italiana: News
- 0430 Radio Havana Cuba: News Update
- 0430 Radio Moscow (World Service): News in Brief
- 0430 Radio Netherlands: News [M-A]
- 0430 WCSN: News [T-A]
- 0445 Radio Berlin Int'l: News

- 0500 BBC: World News
- 0500 Deutsche Welle: World News
- 0500 HCJB: News [S-M]; Latin American News [T-A]
- 0500 KYOI: News [M-F]
- 0500 Radio Australia: World and Australian News
- 0500 Radio Berlin Int'l: News
- 0500 Radio Japan: News [S-F]
- 0500 Radio Moscow: News
- 0500 Radio New Zealand Int'l: News
- 0500 Spanish National Radio: News
- 0500 Voice of America: News
- 0500 WCSN: News [M-F]
- 0515 Radio Canada Int'l: News [M-F]
- 0530 Radio Moscow (World Service): News in Brief [S]
- 0530 WCSN: News [T-F]
- 0545 Radio Canada Int'l: News [M-F]
- 0550 HCJB: News [T-A]
- 0551 Spanish National Radio: News Summary [S]

- 0555 HCJB: News [S]
- 0600 BBC: Newsdesk
- 0600 Deutsche Welle: World News
- 0600 HCJB: News [M]
- 0600 KYOI: News [M-F]
- 0600 Radio Australia: International Report
- 0600 Radio Korea: News
- 0600 Radio Moscow: News
- 0600 Voice of America: News
- 0600 WCSN: News [M-F]
- 0615 Radio Berlin Int'l: News
- 0630 Radio Finland: Northern Report [T-A]
- 0630 Radio Moscow (World Service): News in Brief [S-M]
- 0630 Swiss Radio Int'l: News
- 0630 WCSN: News [T-F]
- 0655 HCJB: News [M-A]
- 0700 BBC: World News
- 0700 BRT, Brussels: News [M-F]
- 0700 KYOI: News [M-F]
- 0700 Radio Australia: World and Australian News

program

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An American in Taipei: Stephen Burstein presents the news and "Taiwan Economic Report" on the Voice of Free China.

- 1645 BBC: The World Today. See M 1645.
- 1645 Radio Australia: Sports Results. See S 1330.
- 1645 Voice of America: Science in the News (Special English). See T 1115.
- 2309 BBC: Commentary. See M 2309.
- 2310 Voice of America: Newsline. See S 0010.
- 2313 Radio Australia: Window on Australia. See M 0113.
- 2315 BBC: Concert Hall. See S 1515.
- 2330 Radio Australia: Smith's Weekly. See S 1313.
- 2330 Voice of America: VOA Morning. See S 0045.

Wednesday

July 5, 12, 19, 26

- 0010 Voice of America (Americas): Newsline. See S 0010.
- 0010 Voice of America (Caribbean): Caribbean Report. See T 0010.
- 0010 Voice of America (East Asia): Newsline. See S 0010.
- 0030 BBC: Omnibus. See T 1615.
- 0030 Radio Australia: Music of Radio Australia. See S 0313.
- 0030 Voice of America (Caribbean): Now Music, U.S.A. See T 1130.
- 0040 Voice of America (Americas, East Asia):

- Agriculture Report (Special English). See T 1110.
- 0045 Voice of America (Americas): Science in the News (Special English). See T 1115.
- 0045 Voice of America (East Asia): VOA Morning. See S 0045.
- 0101 BBC: Outlook. See M 1405.
- 0110 Voice of America (Americas, Caribbean): Report to the Americas. See T 0110.
- 0110 Voice of America (South Asia): Newsline. See S 0010.
- 0113 Radio Australia: Window on Australia. See M 0113.
- 0125 BBC: Financial News. See T 0125.
- 0130 BBC: Mining the Past. A look at museums which offer audio-visual historical experiences to visitors.
- 0130 Radio Australia: Try to Remember. See T 1530.
- 0130 Voice of America (South Asia): VOA Morning. See S 0045.
- 0145 BBC: Country Style. Uh oh - it's back! British country music! Hide the children!
- 0155 Voice of America (Americas, Caribbean): Editorial. See S 1455.
- 0209 BBC: British Press Review. See S 0209.
- 0210 Voice of America (Americas, Caribbean): Focus. See M 1110.
- 0210 Voice of America (South Asia): Newsline. See S 0010.
- 0215 BBC: Tech Talk. See M 1115.
- 0230 BBC: Bring Your Own Popcorn. Adrian Love presents music from the movies.
- 0230 Radio Australia: Anything Goes. See S 0030.
- 0230 Voice of America (South Asia): VOA Morning. See S 0045.
- 0310 Voice of America: Daybreak Africa. See M 0310.
- 0313 Radio Australia: Music of Radio Australia. See S 0313.
- 0315 BBC: The World Today. See M 1645.
- 0330 BBC: Discovery. An in-depth look at scientific matters.
- 0330 Radio Australia: Sports Results. See S 1330.
- 0345 Radio Australia: Music of Radio Australia. See S 0313.
- 0410 Voice of America: Newsline. See S 0010.
- 0425 Radio Australia: Propagation Report. See M 0425.
- 0430 BBC: Business Matters. A weekly survey of commercial and financial news.
- 0430 Radio Australia: Smith's Weekly. See S 1313.
- 0430 Voice of America: VOA Morning. See S 0045.
- 0445 BBC: Country Style. See W 0145.
- 0509 BBC: Twenty-Four Hours. See S 0509.
- 0510 Voice of America: Newsline. See S 0010.
- 0513 Radio Australia: Music of Radio Australia. See S 0313.
- 0530 BBC: Financial News. See T 0125.
- 0530 Voice of America: VOA Morning. See S 0045.
- 0533 Radio Australia: Window on Australia. See M 0113.
- 0540 BBC: Words of Faith. See S 0540.
- 0545 BBC: The World Today. See M 1645.
- 0615 Voice of America (Africa): Daybreak Africa. See M 0310.
- 0610 Voice of America: Newsline. See S 0010.
- 0630 BBC: Meridian. The world of the arts, including music, drama, and books.
- 0630 Radio Australia: Music of Radio Australia. See S 0313.
- 0630 Voice of America: VOA Morning. See S 0045.
- 0645 Radio Australia: Unsung Heroes and Heroines. See S 0330.
- 0709 BBC: Twenty Four Hours. See S 0509.
- 0713 Radio Australia: Music of Radio Australia. See S 0313.
- 0730 BBC: Development 89. Aid and development issues.
- 1110 Voice of America (Caribbean): Focus. See M 1110.
- 1110 Voice of America: Science Report (Special English). See M 1110.
- 1113 Radio Australia: Window on Australia. See M 0113.
- 1115 BBC: Country Style. See W 0145.
- 1115 Voice of America: Space and Man (Special English). A feature program in s-l-o-w English.
- 1130 BBC: Meridian. See W 0630.
- 1130 Radio Australia: Music of Radio Australia. See S 0313.
- 1130 Voice of America (Caribbean): VOA Morning. See S 0045.
- 1130 Voice of America: Now Music, U.S.A. See T 1130.
- 1210 Voice of America: Newsline. See S 0010.
- 1215 BBC: They Made Our World. Great scientists, inventors, and other pioneers who shaped the modern world.
- 1225 BBC: The Farming World. Issues in agriculture.
- 1225 Radio Australia: Propagation Report. See M 0425.
- 1230 Radio Australia: Interaction. An exploration of the activities and experiences of multicultural Australia.
- 1230 Voice of America: Magazine Show. See M 1230.
- 1245 BBC: Sports Roundup. See S 1330.
- 1309 BBC: Twenty-Four Hours. See S 0509.
- 1310 Voice of America: Focus. See M 1110.

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- 0700 Radio Japan: News [S-F]
- 0700 Radio Moscow (World Service): News
- 0700 Voice of Free China: News and Commentary
- 0700 WCSN: News [M-F]
- 0730 Radio Moscow (World Service): News in Brief
- 0730 Radio Netherlands: News [M-A]
- 0730 WCSN: News [T-F]
- 0745 Radio Berlin Int'l: News
- 0800 BBC: World News
- 0800 KYO: News [M-F]
- 0800 Radio Australia: International Report
- 0800 Radio Berlin Int'l: News
- 0800 Radio Finland: Northern Report [T-S]
- 0800 Radio Korea: News
- 0800 Radio Moscow (World Service): News
- 0830 Radio Finland: Northern Report [T-S]
- 0830 Radio Moscow (World Service): News in Brief [S-M]

- 0830 Radio Netherlands: News [M-A]
- 0830 Swiss Radio Int'l: News
- 0900 BBC: World News
- 0900 BRT, Brussels: News [M-F]
- 0900 Deutsche Welle: World News
- 0900 KYO: News [M-F]
- 0900 Radio Australia: World and Australian News
- 0900 Radio Japan: News [S-F]
- 0900 Radio Moscow (World Service): News
- 0930 Radio Canada Int'l: News [M-F]
- 0930 Radio Moscow (World Service): News in Brief [S]
- 1000 BBC: News Summary
- 1000 Kol Israel: News
- 1000 KYO: News [M-F]
- 1000 Radio Australia: International Report
- 1000 Radio Berlin Int'l: News
- 1000 Radio Moscow (World Service): News
- 1000 Radio New Zealand Int'l: News [M-F]
- 1000 Swiss Radio Int'l: News
- 1000 Voice of America: News

- 1030 KYO: News [T-F]
- 1030 Radio Moscow (World Service): News in Brief [S-M]
- 1030 Radio Netherlands: News [M-A]
- 1030 Voice of America (Special English): News [S]
- 1100 BBC: World News
- 1100 Deutsche Welle: World News
- 1100 KYO: News [M-F]
- 1100 Radio Australia: World and Australian News
- 1100 Radio Beijing: News
- 1100 Radio Berlin Int'l: News
- 1100 Radio Finland: Northern Report [T-F]
- 1100 Radio Japan: News [S-F]
- 1100 Radio Korea: News
- 1100 Radio Moscow (World Service): News
- 1100 Radio New Zealand Int'l: News
- 1100 Radio RSA: News
- 1100 Swiss Radio Int'l: News
- 1100 Voice of America: News
- 1109 BBC: News About Britain

program

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- 1313 Radio Australia: Music of Radio Australia. See S 0313.
 1330 BBC: Development 89. See W 0730.
 1330 Radio Australia: Sports Results. See S 1330.
 1340 Voice of America: Science Report (Special English). See M 1110.
 1345 Radio Australia: Music of Radio Australia. See S 0313.
 1345 Voice of America: Space and Man (Special English). See W 1115.
 1405 BBC: Outlook. See M 1405.
 1410 Voice of America: Asia Report. See M 1410.
 1425 Radio Australia: Stock Exchange Report. See M 1425.
 1430 Radio Australia: Window on Australia. See M 0113.
 1445 BBC: Business Matters. See W 0430.
 1455 Voice of America: Editorial. See S 1455.
 1510 Voice of America: Newsline. See S 0010.
 1513 Radio Australia: Music of Radio Australia. See S 0313.
 1515 BBC: Feature. See M 2315.
 1530 BBC: Flying the Flag. Intrigue and comedy in a fictional communist nation.
 1530 Radio Australia: Along the Mighty Murray. People, places, and events encountered along Australia's greatest river.
 1530 Voice of America: Magazine Show. See M 1230.
 1610 Voice of America (Africa): Nightline Africa (until 1700). See S 1610.
 1610 Voice of America: Focus. See M 1110.
 1615 BBC: Counterpoint. See T 0630.
 1625 Radio Australia: Stock Exchange Report. See M 1425.
 1627 Radio Australia: Propagation Report. See M 0425.
 1630 Radio Australia: Music of Radio Australia. See S 0313.
 1640 Voice of America: Science Report (Special English). See M 1110.
 1645 BBC: The World Today. See M 1645.
 1645 Radio Australia: Sports Results. See S 1330.
 1645 Voice of America: Space and Man (Special English). See W 1115.
 2309 BBC: Commentary. See M 2309.
 2310 Voice of America: Newsline. See S 0010.
 2313 Radio Australia: Music of Radio Australia. See S 0313.
 2315 BBC: Good Books. See M 0315.
 2330 BBC: Multitrack 2. Mitchell Johnson presents pop music and news.
 2330 Radio Australia: You Asked For It. See S 0713.
 2330 Voice of America: VOA Morning. See S 0045.
 2345 Radio Australia: Music of Radio Australia.

Thursday

July 6, 13, 20, 27

- 0010 Voice of America (Americas): Newsline. See S 0010.
 0010 Voice of America (Caribbean): Caribbean Report. See T 0010.
 0010 Voice of America (East Asia): Newsline. See S 0010.
 0030 BBC: Flying the Flag. See W 1530.
 0030 Radio Australia: Music of Radio Australia. See S 0313.
 0030 Voice of America (Caribbean): Now Music, U.S.A. See T 1130.



Marie Jaurto, Pierre Thewrewk-Pallaghy and Kristina Haataja of Radio Finland's staff.

- 0040 Voice of America (Americas, East Asia): Science Report (Special English) See M 1110.
 0045 Voice of America (Americas): Space and Man (Special English). See W 1115.
 0045 Voice of America (East Asia): VOA Morning. See S 0045.
 0101 BBC: Outlook. See M 1405.
 0110 Voice of America (Americas, Caribbean): Report to the Americas. See T 0110.
 0110 Voice of America (South Asia): Newsline. See S 0010.
 0113 Radio Australia: Window on Australia. See M 0113.
 0125 BBC: Financial News. See T 0125.
 0130 BBC: Waveguide. See S 0750.

- 0130 Radio Australia: Interaction. See W 1230.
 0130 Voice of America (South Asia): VOA Morning. See S 0045.
 0140 BBC: Book Choice. See S 0745.
 0145 BBC: Society Today. A weekly look at the changes in Britain.
 0155 Voice of America (Americas, Caribbean): Editorial. See S 1455.
 0209 BBC: British Press Review. See S 0209.
 0210 Voice of America (Americas, Caribbean): Focus. See M 1110.
 0210 Voice of America (South Asia): Newsline. See S 0010.
 0215 BBC: Network UK. See T 0215.
 0230 BBC: Assignment. A weekly examination of a topical issue.
 0230 Radio Australia: Word of Mouth. Oral histories of Australians.
 0230 Voice of America (South Asia): VOA Morning. See S 0045.
 0310 Voice of America: Daybreak Africa. See M 0310.
 0313 Radio Australia: Music of Radio Australia. See S 0313.
 0315 BBC: The World Today. See M 1645.
 0330 BBC: Brain of Britain. See M 1215.
 0330 Radio Australia: Sports Results. See S 1330.
 0345 Radio Australia: Music of Radio Australia. See S 0313.
 0410 Voice of America: Newsline. See S 0010.
 0420 Radio Australia: Propagation Report. See M 0425.
 0430 BBC: Society Today. See H 0145.
 0430 Radio Australia: Innovations. See S 1430.
 0430 Voice of America: VOA Morning. See S 0045.
 0445 BBC: Andy Kershaw's World of Music. See M 0215.
 0509 BBC: Twenty-Four Hours. See S 0509.
 0510 Voice of America: Newsline. See S 0010.
 0513 Radio Australia: Music of Radio Australia. See S 0313.
 0530 BBC: Financial News. See T 0125.
 0530 Voice of America: VOA Morning. See S 0045.
 0533 Radio Australia: Window on Australia. See M 0113.
 0540 BBC: Words of Faith. See S 0540.
 0545 BBC: The World Today. See M 1645.
 0610 Voice of America (Africa): Daybreak Africa. See M 0310.
 0610 Voice of America: Newsline. See S 0010.
 0630 BBC: They Made Our World. See W 1215.
 0630 Radio Australia: Interaction. See W 1230.
 0630 Voice of America: VOA Morning. See S 0045.
 0640 BBC: The Farming World. See W 1225.
 0709 BBC: Twenty-Four Hours. See S 0509.
 0713 Radio Australia: Music of Radio Australia.

- 1110 Radio Beijing: News About China
 1130 KYOI: News [T-F]
 1130 Radio Moscow (World Service): News in Brief
 1130 Radio Netherlands: News [M-A]
 1130 Voice of America (Special English): News [M-F]
 1152 Radio RSA: News in Brief
 1200 BBC: News Summary [S]; Newsreel [M-A]
 1200 KYOI: News [M-F]
 1200 Radio Australia: International Report
 1200 Radio Beijing: News
 1200 Radio Canada Int'l: World Report [M-F]
 1200 Radio Finland: Northern Report [T-F]
 1200 Radio Moscow (World Service): News
 1200 Swiss Radio Int'l: News
 1200 Voice of America: News
 1210 Radio Beijing: News About China
 1215 Radio Berlin Int'l: News
 1230 BRT, Brussels: News [M-S]
 1230 KYOI: News [T-F]

- 1230 Radio Berlin Int'l: News
 1230 Radio Moscow (World Service): News in Brief [S-M]
 1300 BBC: World News
 1300 KYOI: News [M-F]
 1300 Radio Australia: World and Australian News
 1300 Radio Berlin Int'l: News
 1300 Radio Canada Int'l (Asia/Pacific): News [S-F]
 1300 Radio Canada Int'l: News [S]
 1300 Radio Finland: Northern Report [T-A]
 1300 Radio Moscow (World Service): News
 1300 Radio RSA: News
 1300 Voice of America: News
 1325 HCJB: News [M-F]
 1330 KYOI: News [T-F]
 1330 Radio Moscow (World Service): News in Brief [S]
 1330 Swiss Radio Int'l: News
 1330 Voice of America (Special English): News

- 1345 Radio Berlin Int'l: News
 1352 Radio RSA: News in Brief
 1400 BBC: News Summary [A-S]; World News [M-F]
 1400 KYOI: News [M-F]
 1400 Radio Australia: International Report
 1400 Radio Beijing: News
 1400 Radio Berlin Int'l: News
 1400 Radio Japan: News [S-F]
 1400 Radio Korea: News
 1400 Radio Moscow (World Service): News
 1400 Radio RSA: News
 1400 Voice of America: News
 1405 Radio Finland: Northern Report [T-A]
 1410 Radio Beijing: News About China
 1425 HCJB: News [M-F]
 1430 Radio Moscow (World Service): News in Brief
 1430 Radio Netherlands: News [M-A]
 1445 Radio Canada Int'l: News
 1500 BBC: Newsreel
 1500 Deutsche Welle: World News

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- 0730 BBC: Mediawatch. A look at the new technology behind and significance of communications.
- 0730 Radio Australia: Taim Bilong Masta. See T 0230.
- 0745 BBC: Network UK. See T 0215.
- 0745 Radio Australia: Music of Radio Australia. See S 0313.
- 1110 Voice of America (Caribbean): Focus. See M 1110.
- 1110 Voice of America: Science Report (Special English). See M 1110.
- 1113 Radio Australia: Window on Australia. See M 0113.
- 1115 BBC: New Ideas. See T 0445.
- 1115 Voice of America: The Making of a Nation (Special English). See H 0045.
- 1125 BBC: Book Choice. See S 0745.
- 1130 BBC: Drama. A dramatization of a play or book excerpt.
- 1130 Radio Australia: Soundabout. See T 1130.



Gordon Clyde is the low-key disc jockey on "The Pleasure's Yours," a classical music record request show. The show airs on the BBC Thursdays at 1515 UTC.

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- 1500 KYOI: News [M-F]
- 1500 Radio Australia: World and Australian News
- 1500 Radio Beijing: News
- 1500 Radio Japan: News [S-F]
- 1500 Radio Moscow (World Service): News
- 1500 Radio RSA: News
- 1500 Voice of America: News
- 1510 Radio Beijing: News About China
- 1525 HCJB: News [M-F]
- 1527 Radio Veritas Asia: World News [M-A]
- 1530 BRT, Brussels: News [M-S]
- 1530 Deutsche Welle: African News [M-F]
- 1530 Radio Moscow (World Service): News in Brief [S-M]
- 1530 Swiss Radio Int'l: News
- 1545 Radio Berlin Int'l: News
- 1552 Radio RSA: News in Brief
- 1600 BBC: World News
- 1600 Deutsche Welle: World News

- 1130 Voice of America (Caribbean): VOA Morning. See S 0045.
- 1130 Voice of America: Now Music, U.S.A. See T 1130.
- 1210 Voice of America: Newsline. See S 0010.
- 1215 BBC: Multitrack 2. See W 1830.
- 1225 Radio Australia: Propagation Report. See M 0425.
- 1230 Radio Australia: Business Horizons. See T 0430.
- 1230 Voice of America: Magazine Show. See M 1230.
- 1245 BBC: Sports Roundup. See S 1330.
- 1245 Radio Australia: Music of Radio Australia. See S 0313.
- 1309 BBC: Twenty-Four Hours. See S 0509.
- 1310 Voice of America: Focus. See M 1110.
- 1313 Radio Australia: Music of Radio Australia. See S 0313.
- 1330 BBC: Network UK. See T 0215.
- 1330 Radio Australia: Sports Results. See S 1330.
- 1340 Voice of America: Science Report (Special English). See M 1110.
- 1345 BBC: Jazz Scene UK (July 6th, 20th) or Folk in Britain (July 13, 27th). A look at jazz or folk music on the British Isles.
- 1345 Radio Australia: Music of Radio Australia. See S 0313.
- 1345 Voice of America: The Making of a Nation (Special English). See H 0045
- 1405 BBC: Outlook. See M 1405.
- 1410 Voice of America: Asia Report. See M 1410.
- 1425 Radio Australia: Stock Exchange Report. See M 1425.
- 1430 Radio Australia: Window on Australia. See M 0113.
- 1445 BBC: Mediawatch. See H 0730.
- 1455 Voice of America: Editorial. See S 1455.
- 1510 Voice of America: Newsline. See S 0010.
- 1513 Radio Australia: Music of Radio Australia. See S 0313.
- 1515 BBC: The Pleasure's Yours. Gordon Clyde presents classical music requests.
- 1530 Radio Australia: Arts Roundabout. See S 0430.
- 1530 Voice of America: Magazine Show. See M 1230.
- 1610 Voice of America (Africa): Nightline Africa (until 1700). See S 1610.
- 1610 Voice of America: Focus. See M 1110.
- 1615 BBC: Assignment. See H 0230.
- 1625 Radio Australia: Stock Exchange Report. See M 1425.
- 1627 Radio Australia: Propagation Report. See M 0425.
- 1630 Radio Australia: Music of Radio Australia. See
- 1130 S 0313.
- 1640 Voice of America: Science Report (Special English). See M 1110.
- 1645 BBC: The World Today. See M 1645.
- 1645 Radio Australia: Sports Results. See S 1330.
- 1645 Voice of America: The Making of a Nation (Special English). See H 0045.
- 2309 BBC: Commentary. See M 2309.
- 2310 Voice of America: Newsline. See S 0010.
- 2313 Radio Australia: Music of Radio Australia. See S 0313.
- 2315 BBC: Music Review. Classical music events and developments from around the world.
- 2330 Radio Australia: Book Readings. See M 1345.
- 2330 Voice of America: VOA Morning. See S 0045.
- 2345 Radio Australia: Boomerang. See S 0113.

Friday

July 7, 14, 21, 28

- 0010 Voice of America (Americas): Newsline. See S 0010.
- 0019 Voice of America (Caribbean): Caribbean Report. See T 0010.
- 0010 Voice of America (East Asia): Newsline. See S 0010.
- 0030 BBC: Malcolm Arnold. Conversations with one of Britain's foremost orchestral composers. (except July 28th; Musical Feature, programming on various musical topics).
- 0030 Radio Australia: Music of Radio Australia. See S 0313.
- 0030 Voice of America (Caribbean): Now Music, U.S.A. See T 1130.
- 0040 Voice of America (Americas, East Asia): Science Report (Special English). See M 1110.
- 0045 Voice of America (Americas): The Making of a Nation (Special English). See H 0045.
- 0045 Voice of America (East Asia): VOA Morning. See S 0045.
- 0101 BBC: Outlook. See M 1405.
- 0110 Voice of America (Americas, Caribbean): Report to the Americas. See T 0110.
- 0110 Voice of America (South Asia): VOA Morning. See S 0045.
- 0113 Radio Australia: Window on Australia. See M 0113.
- 0125 BBC: Financial News. See T 0125.
- 0130 BBC: Folk in Britain (July 14th, 28th) or Jazz Scene UK (July 7, 21st). See H 1345.
- 0130 Radio Australia: Monitor. See S 2330.
- 0145 BBC: Profile. Character sketches of today's public figures.
- 0155 Voice of America (Americas, Caribbean):

- 1600 Radio Australia: International Report
- 1600 Radio Berlin Int'l: News
- 1600 Radio Korea: News
- 1600 Radio Moscow (World Service): News
- 1600 Voice of America: News
- 1600 WCSN: News [M-F]
- 1609 BBC: News About Britain
- 1615 Radio Canada Int'l: News
- 1625 HCJB: News [M-F]
- 1630 Radio Moscow (World Service): News in Brief [S]
- 1630 Radio Netherlands: News [M-A]
- 1630 Voice of America (Special English): News
- 1630 WCSN: News [M-F]
- 1700 BBC: World News
- 1700 Kol Israel: News
- 1700 Radio Australia: World and Australian News
- 1700 Radio Japan: News [S-F]
- 1700 Radio Moscow (World Service): News
- 1700 Voice of America: News
- 1700 WCSN: News [M-F]
- 1803 Radio Jamahiriya, Libya: Headlines
- 1830 Radio Canada Int'l: News [M-F]
- 1830 Radio Finland: Northern Report [M-F]
- 1700 WCSN: News [M-F]
- 1715 Radio Berlin Int'l: News
- 1730 BRT, Brussels: News
- 1730 Radio Berlin Int'l: News
- 1730 Radio Moscow (World Service): News in Brief
- 1730 Radio New Zealand Int'l: News [S-F]
- 1730 Swiss Radio Int'l: News
- 1730 WCSN: News [M-F]
- 1800 BBC: Newsdesk
- 1800 KYOI: News [M-F]
- 1800 Radio Australia: International Report
- 1800 Radio Canada Int'l: News
- 1800 Radio Korea: News
- 1800 Radio Moscow (World Service): News
- 1800 Radio New Zealand Int'l: News
- 1800 Radio RSA: News
- 1800 Voice of America: News
- 1800 WCSN: News [M-F]

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- Editorial. See S 1455.
 0209 BBC: British Press Review. See S 0209.
 0210 Voice of America (Americas, Caribbean): Focus. See M 1110.
 0210 Voice of America (South Asia): VOA Morning. See S 0045.
 0215 BBC: Seven Seas. A weekly program about ships and the sea.
 0230 BBC: Drama. See H 1130.
 0230 Radio Australia: Music of Radio Australia. See S 0313.
 0310 Voice of America: Daybreak Africa. See M 0310.
 0313 Radio Australia: Music of Radio Australia. See S 0313.
 0315 BBC: The World Today. See M 1645.
 0330 BBC: Focus on Faith. Comment and discussion on the major issues in the world of faith.
 0330 Radio Australia: Sports Results. See S 1330.
 0345 Radio Australia: Music of Radio Australia. See S 0313.
 0410 Voice of America: Newsline. See S 0010.
 0425 Radio Australia: Propagation Report. See M 0425.
 0430 BBC: Short Story. See T 0130.
 0430 Radio Australia: Matters of Faith. See S 1530.
 0430 Voice of America: VOA Morning. See S 0045.
 0445 BBC: Folk in Britain (July 14th, 28th) or Jazz Scene UK (July 7th, 21st). See H 1345.
 0445 Radio Australia: Music of Radio Australia. See S 0313.
 0509 BBC: Twenty-Four Hours. See S 0509.
 0510 Voice of America: Newsline. See S 0010.
 0513 Radio Australia: Music of Radio Australia. See S 0313.
 0530 BBC: Financial News. See T 0125.
 0530 Voice of America: VOA Morning. See S 0045.
 0533 Radio Australia: Window on Australia. See M 0113.
 0540 BBC: Words of Faith. See S 0540.
 0545 BBC: The World Today. See M 1645.
 0610 Voice of America (Africa): Daybreak Africa. See M 0310.
 0610 Voice of America: Newsline. See S 0010.
 0630 BBC: Meridian. See W 0630.
 0630 Radio Australia: Business Horizons. See T 0430.
 0630 Voice of America: VOA Morning. See S 0045.
 0709 BBC: Twenty-Four Hours. See S 0509.
 0713 Radio Australia: Music of Radio Australia. See S 0313.
 0730 BBC: Royal London. A look at royal domiciles and the stories behind them.
 0730 Radio Australia: Arts Roundabout. See S

0430.
 1110 Voice of America (Caribbean): Focus. See M 1110.
 1110 Voice of America: Science Report (Special English). See M 1110.
 1113 Radio Australia: Window on Australia. See M 0113.
 1115 BBC: Profile. See F 1045.
 1115 Voice of America: American Mosaic (Special English). A feature program in s-l-o-w English.



Richard Carlson, Director of the VOA

- 1130 BBC: Meridian. See W 0630.
 1130 Radio Australia: International Top Hits. See S 1130.
 1130 Voice of America (Caribbean): VOA Morning. See S 0045.
 1130 Voice of America: Country Music, U.S.A. Current popular country music tunes with a sprinkling of old favorites.
 1210 Voice of America: Newsline. See S 0010.
 1215 BBC: Royal London. See F 0730.
 1225 Radio Australia: Propagation Report. See M 0425.
 1230 Radio Australia: Music of Radio Australia. See S 0313.
 1230 Voice of America: Magazine Show. See M 1230.
 1245 BBC: Sports Roundup. See S 1330.
 1309 BBC: Twenty-Four Hours. See S 0509.
 1310 Voice of America: Focus. See M 1110.
 1313 Radio Australia: Window on Australia. See M 0113.
 1330 BBC: John Peel. See T 0330.
 1330 Radio Australia: Sports Results. See S 1330.
 1340 Voice of America: Science Report (Special English). See M 1110.
 1345 Radio Australia: Music of Radio Australia. See S 0313.

- 1345 Voice of America: American Mosaic (Special English). See F 1115.
 1405 BBC: Outlook. See M 1405.
 1410 Voice of America: Asia Report. See M 1410.
 1425 Radio Australia: Stock Exchange Report. See M 1425.
 1430 Radio Australia: Window on Australia. See M 0113.
 1445 BBC: Nature Now. See M 0445.
 1455 Voice of America: Editorial. See S 1455.
 1510 Voice of America: Newsline. See S 0010.
 1513 Radio Australia: Music of Radio Australia. See S 0313.
 1515 BBC: Music Review. See H 2315.
 1530 Radio Australia: Taim Bilong Masta. See T 0230.
 1530 Voice of America: Magazine Show. See M 1230.
 1610 Voice of America (Africa): Nightline Africa (until 1700). See S 1610.
 1610 Voice of America: Focus. See M 1110.
 1615 BBC: Science in Action. See M 0230.
 1625 Radio Australia: Stock Exchange Report. See M 1425.
 1627 Radio Australia: Propagation Report. See M 0425.
 1630 Radio Australia: Music of Radio Australia. See S 0313.
 1640 Voice of America: Science Report (Special English). See M 1110.
 1645 BBC: The World Today. See M 1645.
 1645 Radio Australia: Sports Results. See S 1330.
 1645 Voice of America: American Mosaic (Special English). See F 1115.
 2309 BBC: Commentary. See M 2309.
 2310 Voice of America: VOA Morning. See S 0045.
 2313 Radio Australia: Music of Radio Australia. See S 0313.
 2315 BBC: From the Weeklies. A review of the British weekly press.
 2330 BBC: Multitrack 3. Sarah Ward presents innovative and alternative rock music.
 2330 Radio Australia: Unsung Heroes and Heroines. See S 0330.

Saturday

July 1, 8, 15, 22, 29

- 0010 Voice of America (Americas, Caribbean): Newsline. See S 0010.
 0010 Voice of America (East Asia): VOA Morning. See S 0045.
 0030 BBC: Personal View. Opinion on topical issues in British life.
 0030 Radio Australia: Just Out. A look at recent

- 1830 Radio Kuwait: News
 1830 Radio Moscow (World Service): News in Brief [A-S]
 1830 Radio Netherlands: News [M-A]
 1830 Radio New Zealand Int'l: News [M-F]
 1830 Swiss Radio Int'l: News
 1830 Voice of America (Special English): News
 1830 WCSN: News [M-F]
 1847 Radio Jamahiriya, Libya: News
 1852 Radio RSA: News in Brief
 1900 BBC: News Summary
 1900 Deutsche Welle: World News
 1900 HCJB: Latin American News [M-F]
 1900 Kol Israel: News
 1900 KYOI: News [M-F]
 1900 Radio Australia: World and Australian News
 1900 Radio Canada Int'l: News [M-F]
 1900 Radio Havana Cuba: International News
 1900 Radio Japan: News

- 1900 Radio Moscow (World Service): News
 1900 Radio New Zealand Int'l: News
 1900 Radio RSA: News
 1900 Spanish National Radio: News
 1900 Voice of America: News
 1900 WCSN: News [M-F]
 1915 Radio Berlin Int'l: News
 1930 Radio Havana Cuba: News Update
 1930 Radio Moscow (World Service): News in Brief [S]
 1930 WCSN: News [M-F]
 1935 Radiotelevisione Italiana: News
 1945 Radio Berlin Int'l: News
 1950 HCJB: News [M-F]
 2000 BBC: World News
 2000 KYOI: News [S-F]
 2000 Radio Australia: International Report
 2000 Radio Berlin Int'l: News
 2000 Radio Jordan: News
 2000 Radio Moscow (World Service): News
 2000 Radio New Zealand Int'l: News
 2000 Radio RSA: News

- 2000 Voice of America: News
 2000 WCSN: News [M-F]
 2025 Radiotelevisione Italiana: News
 2030 KYOI: News [M-H]
 2030 Radio Korea: News
 2030 Radio Moscow (World Service): News in Brief
 2030 Radio Netherlands: News [M-A]
 2030 WCSN: News [M-F]
 2052 Radio RSA: News in Brief
 2100 BBC: News Summary
 2100 BRT, Brussels: News
 2100 Deutsche Welle: World News
 2100 KVOH: UPI Radio News
 2100 KYOI: News [S-F]
 2100 Radio Australia: World and Australian News
 2100 Radio Berlin Int'l: News
 2100 Radio Canada Int'l: News [A-S]; The World At Six [M-F]
 2100 Radio Finland: Northern Report [M-F]
 2100 Radio Japan: News

program

guide

- Australian music releases.
- 0030 Voice of America (Caribbean): Country Music, U.S.A. See F 1130.
- 0040 Voice of America (Americas, East Asia): Science Report (Special English). See M 1110.
- 0045 BBC: Recording of the Week. See M 0545.
- 0045 Voice of America (Americas): American Mosaic (Special English). See F 1115.
- 0045 Voice of America (East Asia): VOA Morning. See S 0045.
- 0101 BBC: Outlook. See M 1405.
- 0110 Voice of America (Americas, Caribbean): Report to the Americas. See T 0110.
- 0110 Voice of America (South Asia): VOA Morning. See S 0045.
- 0113 Radio Australia: Music of Radio Australia. See S 0313.
- 0125 BBC: Financial News. See T 0125.
- 0130 BBC: Poetry of the Century. A look at verse written during the 20th century.
- 0130 Radio Australia: Australian Country Style. See M 0630.
- 0145 BBC: Book Choice. See S 0745.
- 0150 BBC: New Ideas. See T 0445.
- 0155 Voice of America (Americas, Caribbean): Editorial. See S 1455.
- 0209 BBC: British Press Review. See S 0209.
- 0210 Voice of America (Americas, Caribbean): Focus. See M 1110.
- 0210 Voice of America (South Asia): VOA Morning. See S 0045.
- 0215 BBC: Network UK. See T 0215.
- 0230 BBC: People and Politics. Background to the British political scene.
- 0230 Radio Australia: Unsung Heroes and Heroines. See S 0330.
- 0310 Voice of America: VOA Morning. See S 0045.
- 0313 Radio Australia: You Asked For It. See S 0713.
- 0315 BBC: The World Today. See M 1645.
- 0330 BBC: The Vintage Chart Show. Past top ten hits with Jimmy Savile.
- 0330 Radio Australia: Music of Radio Australia. See S 0313.
- 0410 Voice of America: VOA Morning. See S 0045.
- 0425 Radio Australia: Propagation Report. See M 0425.
- 0430 BBC: Here's Humph! All that jazz with Humphrey Lyttelton.
- 0430 Radio Australia: Monitor. See S 2330.
- 0445 BBC: Personal View. See A 0030.
- 0509 BBC: Twenty-Four Hours. See S 0509.
- 0510 Voice of America: VOA Morning. See S 0045.
- 0513 Radio Australia: Music of Radio Australia. See S 0313.
- 0530 BBC: Financial News. See T 0125.
- 0530 Radio Australia: Along the Mighty Murray. See W 1530.
- 0540 BBC: Words of Faith. See S 0540.
- 0545 BBC: The World Today. See M 1645.
- 0610 Voice of America: VOA Morning. See S 0045.
- 0630 BBC: Meridian. See W 0630.
- 0630 Radio Australia: Just Out. See A 0030.
- 0709 BBC: Twenty-Four Hours. See S 0509.
- 0713 Radio Australia: Matter of Faith. See S 1530.
- 0730 BBC: From the Weeklies. See F 2315.
- 0730 Radio Australia: Music of Radio Australia. See S 0313.
- 0745 BBC: Network UK. See T 0215.
- 1110 Voice of America (Caribbean): American Viewpoints. See S 0010.
- 1110 Voice of America: Focus. See M 1110.
- 1113 Radio Australia: Music of Radio Australia. See S 0313.
- 1115 BBC: Poetry of the Century. See A 0130.
- 1130 BBC: Meridian. See W 0630.
- 1130 Radio Australia: Soundabout. See T 1130.
- 1130 Voice of America (Caribbean): Music, U.S.A. (Jazz). Willis Conover looks at jazz of yesterday and today, in the U.S.A. and abroad.
- 1130 Voice of America: Press Conference, U.S.A. See S 0130.
- 1210 Voice of America: Communications World. See S 0110.
- 1215 BBC: Multitrack 3. See F 2330.
- 1225 Radio Australia: Propagation Report. See M 0425.
- 1230 Radio Australia: International Country Music. See M 0230.
- 1230 Voice of America: Weekend Magazine. See S 0030.
- 1245 BBC: Sports Roundup. See S 1330.
- 1309 BBC: Twenty-Four Hours. See S 0509.
- 1310 Voice of America: American Viewpoints. See S 0010.
- 1313 Radio Australia: You Asked for It. See S 0713.
- 1330 BBC: Network UK. See T 0215.
- 1330 Radio Australia: Sports Results. See S 1330.
- 1340 Voice of America: Words and Their Stories (Special English). See S 0040.
- 1345 BBC: Sportsworld (until 1700). Paddy Feeney presents almost three hours of live sports.
- 1345 Radio Australia: Music of Radio Australia. See S 0313.
- 1345 Voice of America: American Stories (Special English). See S 0045.
- 1410 Voice of America: Music, U.S.A. (Jazz). See A 1130.
- 1430 Radio Australia: Boomerang. See S 0113.
- 1445 Radio Australia: Music of Radio Australia. See S 0313.
- 1455 Voice of America: Editorial. See S 1455.
- 1510 Voice of America: Focus. See M 1110.
- 1513 Radio Australia: Matter of Faith. See S 1530.
- 1530 Radio Australia: This Australia. See M 0130.
- 1530 Voice of America: Press Conference, U.S.A. See S 0130.
- 1610 Voice of America (Africa): Nightline Africa. See S 1610.
- 1610 Voice of America: American Viewpoints. See S 0010.
- 1627 Radio Australia: Propagation Report. See M 0425.
- 1630 Radio Australia: Music of Radio Australia. See S 0313.
- 1640 Voice of America: Words and Their Stories (Special English). See S 0040.
- 1645 Radio Australia: Sports Results. See S 1330.
- 1645 Radio Australia: American Stories (Special English). See S 0045.
- 2309 BBC: Book Choice. See S 0745.
- 2310 Voice of America: Newsline. See S 0010.
- 2313 Radio Australia: Music of Radio Australia. See S 0313.
- 2315 BBC: A Jolly Good Show. See T 1515.
- 2330 Radio Australia: Innovations. See S 1430.
- 2330 Voice of America: VOA Morning. See S 0045.

SUGGESTIONS? SOMETHING MISSING?

Let us know your corrections, suggestions and additions by sending them to program manager Kannon Shanmugam at 4412 Turnberry Drive, Lawrence, KS 66046.

Send us your special photos of station personnel (or good photocopies) to share with other readers as we have space; we'll copy and return them to you within the month. Send to QSL, P.O. Box 98, Brasstown, NC 28902.

news guide cont'd from p.63

- 2100 Radio Moscow (World Service): News
- 2100 Spanish National Radio: News
- 2100 Swiss Radio Int'l: News
- 2100 Voice of America: News
- 2100 WCSN: News [M-F]
- 2130 Kol Israel: News
- 2130 KVOH: UPI Headline News
- 2130 KYOI: News [M-H]
- 2130 Radio Canada Int'l (Africa): News
- 2130 RCI: As It Happens [M-F]
- 2130 Radio Moscow (World Service): News in Brief [A-S]
- 2130 Swiss Radio Int'l: News
- 2130 WCSN: News [M-F]
- 2200 BBC: NewsHour
- 2200 KVOH: UPI Radio News
- 2200 KYOI: News [S-H]
- 2200 Radio Australia: International Report
- 2200 Radio Berlin Int'l: News
- 2200 Radio Canada Int'l (Asia/Pacific): News

- 2200 Radio Canada Int'l: News [A-S]; The World At Six [M-F]
- 2200 Radio Moscow: News
- 2200 Radiotelevisione Italiana: News
- 2200 Voice of America: News
- 2200 Voice of Free China: News and Commentary
- 2200 WCSN: News [M-F]
- 2230 KVOH: UPI Headline News
- 2230 KYOI: News [M-H]
- 2230 Radio Moscow (World Service): News in Brief [A-S]
- 2230 Radio Polonia: News
- 2230 Voice of America (Special Eng): News
- 2230 WCSN: News [M-F]
- 2245 Radio Berlin Int'l: News
- 2300 BBC: World News
- 2300 Kol Israel: News
- 2300 KVOH: UPI Radio News
- 2300 KYOI: News [S-H]
- 2300 Radio Australia: World and Australian News

- 2300 Radio Berlin Int'l: News
- 2300 Radio Canada Int'l: News
- 2300 Radio for Peace Int'l: News [F]
- 2300 Radio Japan: News [S-F]
- 2300 Radio Moscow: News
- 2300 Radio New Zealand Int'l: News
- 2300 Voice of America: News
- 2300 Voice of Turkey: News
- 2300 WCSN: News [M-F]
- 2330 BRT, Brussels: News
- 2330 KVOH: UPI Headline News
- 2330 KYOI: News [M-H]
- 2330 Radio Canada Int'l: As It Happens [M-F]; News [A]
- 2330 Radio for Peace Int'l: News [M]
- 2330 Radio Korea: News
- 2330 Radio Moscow (World Service): News in Brief [M]
- 2330 Radio New Zealand Int'l: News [S-H]
- 2330 WCSN: News [M-F]
- 2335 Voice of Greece: News [S]

MT Monitoring Team

**Greg Jordan,
Frequency Manager**

1855-1 Franciscan Terrace
Winston-Salem, NC 27127

Joe Hanlon

Philadelphia, PA

Richard A. Keen

Golden, Colorado

frequency

section

0000 UTC [8:00 PM EDT/5:00 PM PDT]

0000-0030	BBC, London, England	5975 6005 6175 7325 9590 9915 12095 15260
0000-0030	Kol Israel, Jerusalem	15310 15360 17875 11605 15615 15640
0000-0030	Radio Berlin Int'l, East Germany	6080 11890
0000-0030	Radio Korea (South), Seoul	15575
0000-0045	Radio Yugoslavia, Belgrade	9620 11735 15105
0000-0045	WINB, Red Lion, Pennsylvania	15145
0000-0050	Radio Pyongyang, North Korea	15115 15160
0000-0055	Radio Beijing, PR China	9770 11715 15130 17715
0000-0100	All India Radio, New Delhi	6055 7215 9535 9910 11715 11745 15110
0000-0100	CBC Northern Quebec Service	6195 9625
0000-0100	CBN, St. John's, Newfoundland	6160
0000-0100	CBU, Vancouver, British Columbia	6160
0000-0100	CFCF, Montreal, Quebec	6005
0000-0100	CFCN, Calgary, Alberta	6030
0000-0100	CHNS, Halifax, Nova Scotia	6130
0000-0100	Christian Science World Service	7405 9850 13760
0000-0100	CKWX, Vancouver, British Columbia	6080
0000-0100	CFRB, Toronto, Ontario	6070
0000-0100	FEBC, Manila, Philippines	15445
0000-0100	(US) Far East Network, Tokyo	3910
0000-0100	KSDA, Guam	15125
0000-0100 T-A	KVOH, Rancho Simi, California	17775
0000-0100	Radio Australia, Melbourne	15140 15160 15240 15320 17750 17795 21740
0000-0100	Radio Canada Int'l, Montreal	5960 9755
0000-0100	Radio Havana Cuba	11820
0000-0100	Radio Luxembourg	6090

LEGEND

- * The first four digits of an entry are the broadcast start time in UTC. The second four digits represent the end time.
- * In the space between the end time and the station name is the broadcast schedule.

S=Sunday M=Monday T=Tuesday W=Wednesday
H=Thursday F=Friday A=Saturday

If there is no entry, the broadcasts are heard daily. If, for example, there is an entry of "M," the broadcast would be heard only on Mondays. An entry of "M,W,F" would mean Mondays, Wednesdays and Fridays only. "M-F" would mean Mondays through Fridays. "TEN" indicates a tentative schedule and "TES" a test transmission.

- * [ML] after a frequency indicates a multi-lingual transmission containing English-language programs.
- * The last entry on a line is the frequency. Codes here include "SSB" which indicates a Single Sideband transmission, and "V" for a frequency that varies. [ML] after a frequency indicates a multi-lingual transmission containing English-language programs.
- * v after a frequency indicates that it varies
- * Notations of USB and LSB (upper and lower sideband transmissions) usually refer only to the individual frequency after which they appear.
- * Listings followed by an asterisk (*) are for English lessons and do not contain regularly scheduled programming.

We suggest that you begin with the lower frequencies that a station is broadcasting on and work your way up the dial. Remember that there is no guarantee that a station will be audible on any given day. Reception conditions can change rapidly, though, and if it is not audible one night, it may well be on another.

0000-0100	Radio Moscow	11845 12025 17850 17880 21585 21690 21790
0000-0100	Radio Moscow N. America Service	9530 9765 11710 11730 11750 11850 15290 15330
0000-0100	Radio New Zealand, Wellington	15150 17705
0000-0100	Radio Thailand, Bangkok	9655 11905
0000-0100	Radio Tonga, Tonga	5050
0000-0100	SBC Radio One, Singapore	5010 5052 11940
0000-0100	Spanish Foreign Radio, Madrid	9630 15110
0000-0100 T-S	Superpower KUSW, Utah	15580
0000-0100	Voice of America, Washington	5995 6130 9455 9775 9815 11580 11695 11740
0000-0100	WHRI, Noblesville, Indiana	15205 7365 9495
0000-0100	WRNO, New Orleans, Louisiana	7355
0000-0100	WYFR, Oakland, California	5950 15170
0030-0045	BBC, London, England*	6195 7235 9570 11945
0030-0100	BBC, London, England	15360 17875 5975 6005 6175 7325
0030-0100	HCJB, Quito, Ecuador	9515 9580 9915 9590
0030-0100	Radio Budapest, Hungary	11955 12095 15260
0030-0100	Radio Netherlands, Hilversum	11910 15160
0030-0100	SLBC, Colombo, Sri Lanka	6020 6165 15315
0035-0040	All India Radio, New Delhi	6005 9720
0045-0100	Radio Korea (South), Seoul	3925 4860
0045-0100	Radio New Zealand, Wellington	15575
0048-0100	WINB, Red Lion, Pennsylvania	15150 17705
0050-0100	Vatican Radio, Vatican City	15145 9605 11780 15180

0100 UTC [9:00 PM EDT/6:00 PM PDT]

0100-0110	Vatican Radio, Vatican City	9605 11780 15180
0100-0115	All India Radio, New Delhi	6055 7215 9535 9910
0100-0120	RAI, Rome, Italy	11715 11745 15110
0100-0130	Kol Israel, Jerusalem	9575 11800
0100-0130 W,A	Radio Budapest, Hungary	11605 15615 15640 6110 9520 9585 9835
0100-0130	Radio Canada Int'l, Montreal	11910 15160
0100-0130	Radio Japan, Tokyo	9535 11845 11940 13720
0100-0130	Radio Netherlands, Hilversum	17825 6020 6165 15315

HOW TO USE THE PROPAGATION CHARTS

Propagation charts can be an invaluable aid to the DXer in determining which frequencies are likely to be open at a given time. To use the propagation charts, choose those for your location (they are divided into east coast, midwest and west coast of North America). Then look for the one most closely describing the geographic location of the station you want to hear.

Once you've located the correct charts, look along the horizontal axis of the graph for the time that you are listening. The top line of the graph shows the Maximum Useable Frequency [MUF] and the lower line the Lowest Useable Frequency [LUF] as indicated on the vertical axis of the graph.

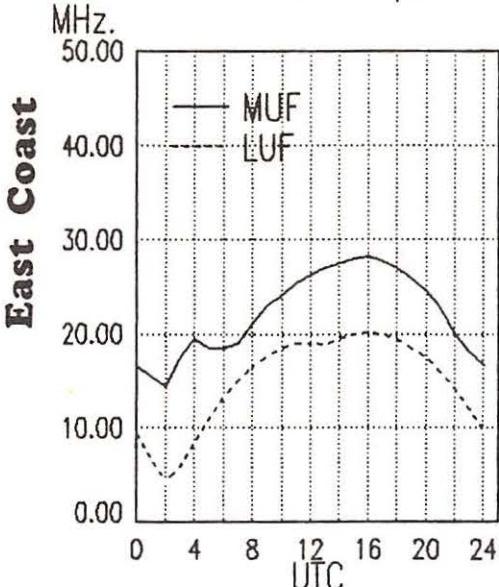
While there are exceptions to every rule (especially those regarding shortwave listening), you should find the charts helpful in determining the best times to listen for particular regions of the world. Good luck!

frequency

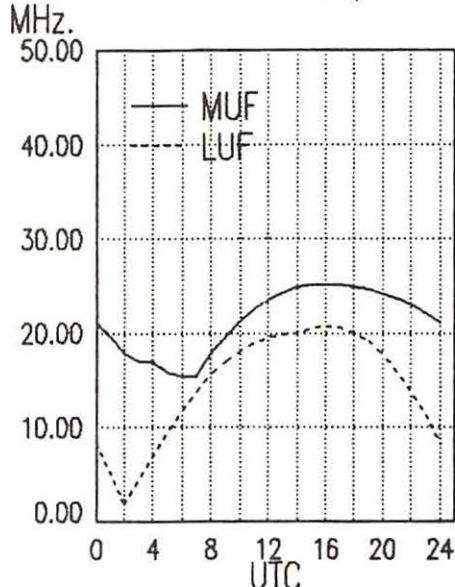
section

0100-0130	Radio Sweden, Stockholm	15390 17790	0100-0200	Voice of America, Washington	5995 6130 7205 9455
0100-0130	Laotian National Radio	7113v			9740 9775 9815 11580
0100-0130 S,M	WINB, Red Lion, Pennsylvania	15145			11740 15205 17735 18157
0100-0145	Radio Berlin Int'l, East Germany	6080 11890	0100-0200	Voice of Indonesia, Jakarta	USB
0100-0150	Deutsche Welle, West Germany	6040 6085 6145 9565	0100-0200	WHRI, Noblesville, Indiana	9680 11790
0100-0200	BBC, London, England	9735 11865 15105	0100-0200	WRNO New Orleans, Louisiana	7365 9495
		5975 6005 6175 7325	0100-0200	WYFR, Oakland, California	7355
		9410 9590 9915 12095	0130-0140 T-S	Voice of Greece, Athens	5950 9505 9680 15170
		15260 17815	0130-0145	WHAM, Radio Budapest, Hungary	9395 9420 11645
0100-0200	CBC Northern Quebec Service	6195 9625			6110 9520 9585 9835
0100-0200	CBN, St. John's, Newfoundland	6160	0130-0155	Radio Austria Int'l, Vienna	11910 15160
0100-0200	CBU, Vancouver, British Columbia	6160	0130-0200	Radio Baghdad, Iraq	9870 9875 13730
0100-0200	CFCF, Montreal, Quebec	6005	0130-0200 S,M	Radio Canada Int'l, Montreal	11800 11945
0100-0200	CFCN, Calgary, Alberta	6030	0130-0200	Radio Veritas Asia, Philippines	9535 11845 11940 13720
0100-0200	CHNS, Halifax, Nova Scotia	6130	0130-0200	WINB, Red Lion, Pennsylvania	15330 15365
0100-0200	Christian Science World Service	9850 11980 13760	0145-0200	Radio Berlin Int'l, East Germany	15145
0100-0200	CKWX, Vancouver, British Columbia	6080			6080 11785 11890 15125
0100-0200	CFRB, Toronto, Ontario	6070			
0100-0200	(US) Far East Network, Tokyo	3910			
0100-0200	FEBC, Manila, Philippines	15445			
0100-0200	HCJB, Quito, Ecuador	9745 11775 15155 15230			
0100-0200 T-A	KVOH, Rancho Simi, California	13695			
0100-0200	Radio Australia, Melbourne	15160 15180 15240 15320	0200-0215	Vatican Radio, Vatican City	6145 7125 9650
		15395 17715 17795	0200-0230	Burma Broadcasting Service, Rangoon	7185
		17750 21740	0200-0230	Radio Berlin Int'l, East Germany	6080 11785 11890 15125
0100-0200	Radio Havana Cuba	11820	0200-0230	Radio Kiev, Ukrainian SSR	11675 11790 11875 12000
0100-0200	Radio Japan, Tokyo	5960 17810 17835 17845	0200-0230	Radio Kiev, Ukrainian SSR	13645 15180 15455
0100-0200	Radio Luxembourg	6090	0200-0230	Swiss Radio Int'l, Berne	6095 6135 9725 9885
0100-0200	Radio Moscow	11845 15590 17600 17655	0200-0250	Deutsche Welle, West Germany	12035 17730
		17825 17850 17860 17880	0200-0250	Deutsche Welle, West Germany	6035 7285 9690 11945
		17890 21585 21690 21790	0200-0250	Radio Bras, Brasilia, Brazil	15205 15235 17770
0100-0200	Radio Moscow, N. American Service	9530 9765 11710 11750	0200-0255	Radio Bucharest, Romania	11745v
		11850 15290 15330	0200-0300	BBC, London, England	6155 9510 9570 11830
0100-0200	Radio New Zealand, Wellington	15150 17705			11940 15380
0100-0200 T-A	Radio for Peace, Costa Rica	13663 21565 25945(A)			5975 6005 6175 7325
0100-0200	Radio Prague, Czechoslovakia	5930 6055 7345 9540			9410 9515 9590 9915
		9625 11990			12095 15260 15310 17875
0100-0200	Radio Thailand, Bangkok	9655 11905	0200-0300	CBC Northern Quebec Service	6195 9625
0100-0200	Radio Tonga, Tonga	5050	0200-0300	CBN, St. John's, Newfoundland	6160
0100-0200	RAE, Buenos Aires, Argentina	9690	0200-0300	CBU, Vancouver, British Columbia	6160
0100-0200	SBC Radio One, Singapore	5052 11940	0200-0300	CFCF, Montreal, Quebec	6005
0100-0200	SLBC, Colombo, Sri Lanka	6005 9720 15425	0200-0300	CFCN, Calgary, Alberta	6030
0100-0200	Spanish Foreign Radio, Madrid	9630 15110	0200-0300	CFRB, Toronto, Ontario	6070
0100-0200 T-S	Superpower KUSW, Utah	11695	0200-0300	CHNS, Halifax, Nova Scotia	6130
			0200-0300	Christian Science World Service	9455 9850 13760

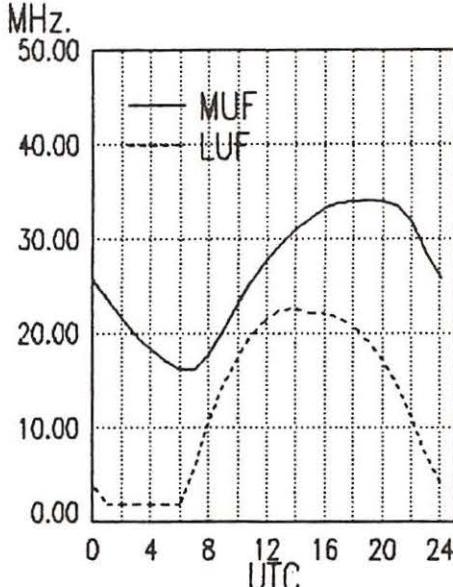
East Coast To
Eastern Europe



East Coast To
Western Europe



East Coast To
West Africa

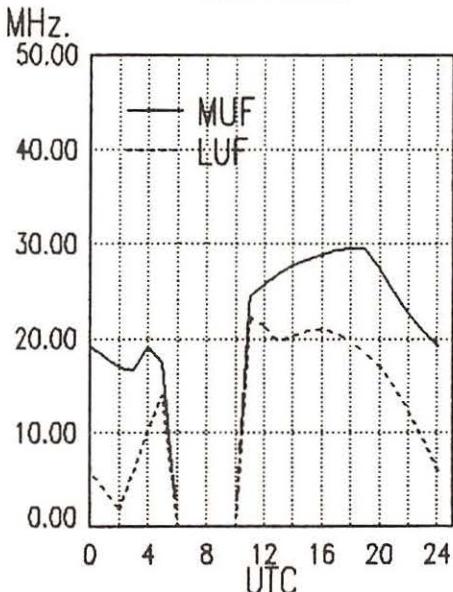


frequency

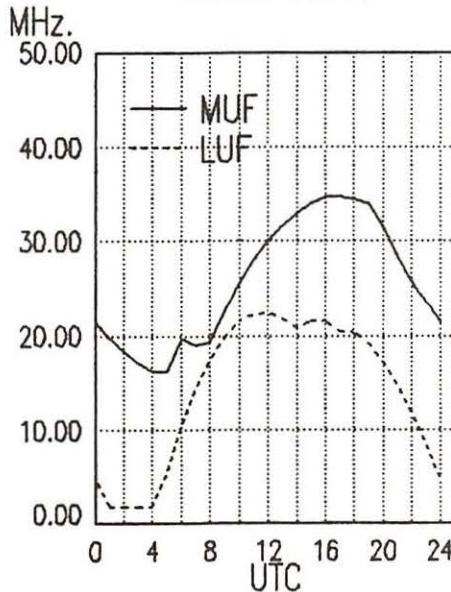
section

0200-0300 CKWX, Vancouver, British Columbia	6080	0230-0300 T-A Radio Portugal, Lisbon	9600	9680	9705	11840	
0200-0300 (US) Far East Network, Tokyo	3910	0240-0250 All India Radio, New Delhi	3905	4860	4880	4895	
0200-0300 HCJB, Quito, Ecuador	9745		5960	5990	6110	6120	
0200-0300 A,S KSDA, Guam	17865		7195	7295	9550	9610	
0200-0300 T-A KVOH, Rancho Simi, California	13695		11830	11870	15305		
0200-0300 Radio Australia, Melbourne	15160 15180 15240 15320	0245-0300 Radio Korea, Seoul, South Korea	9640	15575			
	15395 17715 17750 17795	0255-0300 Radio Yerevan, Armenian SSR	13645	15455			
	21740						
0200-0300 Radio Baghdad, Iraq	11800 11945						
0200-0300 Radio Cairo, Egypt	9475 9675						
0200-0300 T-A Radio Canada Int'l, Montreal	9535 9755 11845	0300-0315 Radio Berlin Int'l, E. Germany	6125	11750	15240		
0200-0300 Radio Havana Cuba	9710 11820	0300-0330 WINB, Red Lion, Pennsylvania	15145				
0200-0300 Radio Luxembourg	6090	0300-0307 Radio Pakistan, Islamabad	5090	5930	7095		
0200-0300 Radio Moscow, USSR	12025 13745 17600 17880	0300-0330 BBC, London, England	3955	5975	6005	6175	
	21690			6195	7325	9410	9660
0200-0300 Radio Moscow N. America Service	9530 9765 11710 11730			9915	11750	11845	12095
	11850 11930 15245 15290			15260	15280	15310	15420
	15330 15540 17860			17815	17875		
0200-0300 Radio Orion, South Africa	3955	0300-0330 Radio Cairo, Egypt	9475	9675			
0200-0300 T-A Radio for Peace, Costa Rica	13663 21565 25945(A)	0300-0330 Radio Japan, Tokyo	9645	15325	17825	21610	
0200-0300 A Radio New Zealand, Wellington	15150 17705	0300-0330 Radio Sweden Int'l, Stockholm	9695	11705			
0200-0300 Radio RSA, South Africa	6010 9580 9615	0300-0345 Radio Berlin Int'l, East Germany	11785	15125			
0200-0300 Radio Thailand, Bangkok	9655 11905	0300-0345 A Radio New Zealand, Wellington	15150	17705			
0200-0300 Radio Tonga, Tonga	5050	0300-0350 Deutsche Welle, West Germany	6085	9545	9605	9700	
0200-0300 SBC Radio One, Singapore	5052 11940			11810	15205		
0200-0300 SLBC, Colombo, Sri Lanka	6005 9720 15425	0300-0350 Radio Baghdad, Iraq	11810	11945			
0200-0300 T-S Superpower KUSW, Utah	11695	0300-0355 Radio Beijing, China	9690	15130			
0200-0300 Voice of America, Washington	5995 6035 7205 9740	0300-0400 CBC Northern Quebec Service	6195	9625	9770	11715	
	15160 15205 18157 USB			15510	17855		
0200-0300 Voice of Asia, Taiwan	7285	0300-0400 CBN, St. John's, Newfoundland	6160				
0200-0300 Voice of Free China, Taiwan	5985 7445 9680 9765	0300-0400 CBU, Vancouver, British Columbia	6160				
	11740 11860 15345	0300-0400 CFCF, Montreal, Quebec	6005				
0200-0300 Voice of Kenya, Nairobi	6045	0300-0400 CFCN, Calgary, Alberta	6030				
0200-0300 WINB, Red Lion, Pennsylvania	15145	0300-0400 CHNS, Halifax, Nova Scotia	6130				
0200-0300 WHRI, Noblesville, Indiana	7365 9495	0300-0400 Christian Science World Service	9455	9850	13760		
0200-0300 WRNO, New Orleans, Louisiana	7355	0300-0400 CKWX, Vancouver, British Columbia	6080				
0200-0300 WYFR, California	5950 9505 15170	0300-0400 CFRB, Toronto, Ontario	6070				
0215-0220 Radio Nepal, Kathmandu	5005 7165	0300-0400 (US) Far East Network, Tokyo	3910				
0230-0240 Port Moresby, Papua New Guinea	3925 4890 5960 5985	0300-0400 HCJB, Quito, Ecuador	9745	11775	15155		
	6020 6040 6080 6140	0300-0400 T-A KVOH, Rancho Simi, California	13695				
	9520	0300-0400 La Voz Evangelica, Honduras	4820				
0230-0245 Radio Pakistan, Islamabad	7010 11570 15115 15580	0300-0400 Radio Australia, Melbourne	11945	15160	15240	15320	
	17660						
0230-0300 Radio Berlin Int'l, E. Germany	9730 13610 15240						
0230-0300 Radio Finland, Helsinki	9635 11945						

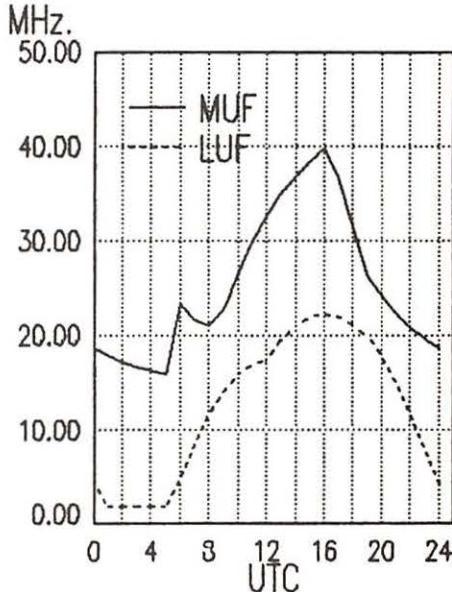
East Coast To
East Africa



East Coast To
Central Africa



East Coast To
South Africa



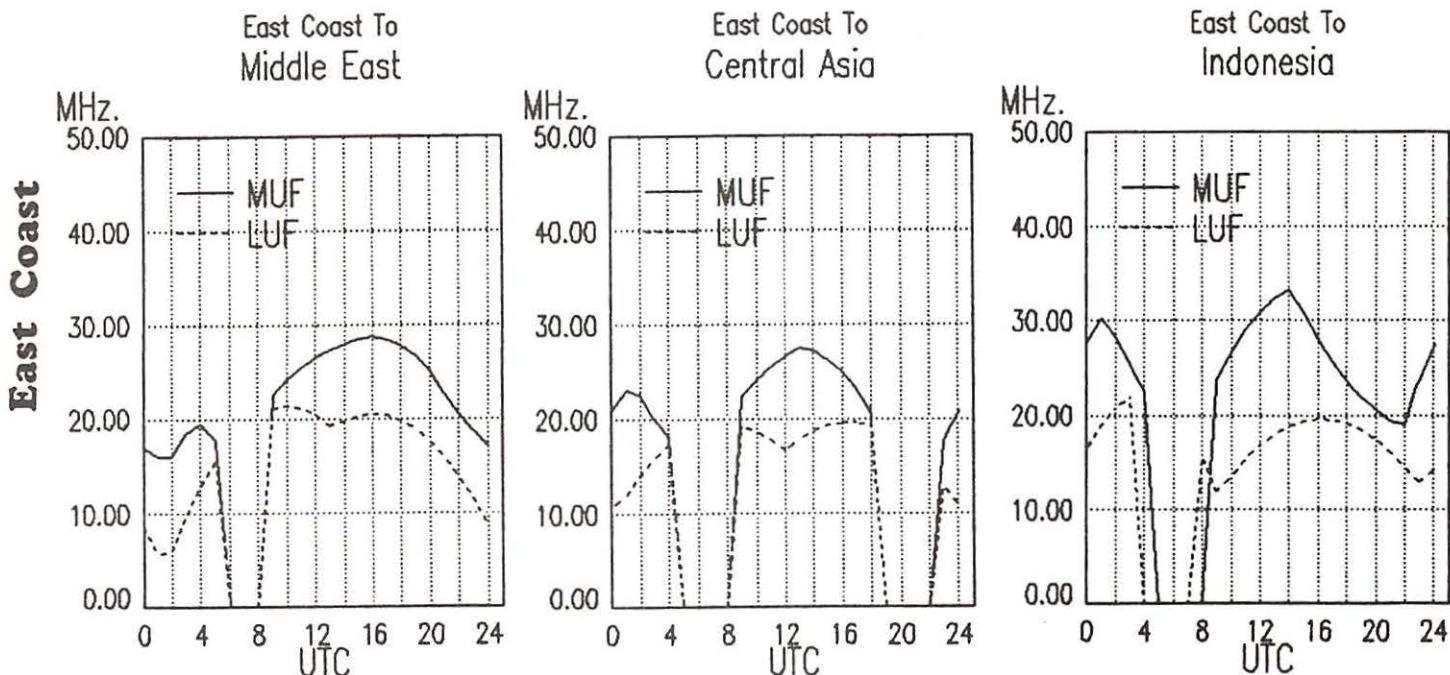
East Coast

frequency

section

0300-0400	Radio Havana Cuba	15395 17715 17750 17795
0300-0400	Radio Japan, Tokyo	21740 9710 11820
0300-0400	Radio Moscow, USSR	17765 17810 17835 9530 9765 11675 11710
		11850 11930 12010 12050
		15180 15330 15405 15425
		15455 17860 17880
0300-0400 T-A	Radio for Peace, Costa Rica	13663 21565 25945
0300-0400	Radio Prague, Czechoslovakia	5930 7345 9540 11685
		11990 13715 15540
0300-0400	Radio Sofia, Bulgaria	15290
0300-0400	Radio Thailand, Bangkok	9655 11905
0300-0400	SBC Radio One, Singapore	5052 11940
0300-0400	SLBC, Colombo, Sri Lanka	6005 9720 15425
0300-0400 T-S	Superpower KUSW, Utah	11695
0300-0400	Trans World Radio, Bonaire	9535 11930
0300-0400	Voice of America, Washington	5995 6035 7280 9525
0300-0400	Voice of Free China, Taiwan	5985 7445 9680 11745
0300-0400	Voice of Kenya, Nairobi	15345 6045
0300-0400	Voice of Turkey, Ankara	9445 17760
0300-0400	WHRI, Noblesville, Indiana	7365 9495
0300-0400	WMLK, Bethel, Pennsylvania	9465
0300-0400	WRNO, New Orleans, Louisiana	6185
0300-0400	WYFR Satellite Net, California	5950 9505 15566
0310-0330	Vatican Radio, Vatican City	11725
0313-0400	Radio France Int'l, Paris	3965 7135 9550 9790
0330-0400	BBC, London, England	11670 11700 11995 15135 3955 5975 6005 6175 6195 9410 9915 12095
0330-0400	Radio Netherland, Hilversum	15420 17815 6165 9590
0330-0400 S,M	WINB, Red Lion, Pennsylvania	15145
0335-0400	Radio New Zealand, Wellington	15150 17705
0330-0400	Radio Tanzania, Dar es Salaam	9684
0330-0400	Radio Tirana, Albania	9500
0330-0400	United Arab Emirates Radio	9555 11940 15435 17890
0335-0340	All India Radio, New Delhi	3905 4860 9610 11830 11870 11890 15305
0340-0350 M-A	Voice of Greece, Athens	7430 9395 9420
0345-0400	Radio Berlin Int'l, East Germany	11785 15125
0350-0400	RAI, Rome, Italy	15330 17795 21610

0400 UTC [12:00 AM EDT/9:00 PM PDT]	
0400-0405	Radio Uganda, Kampala
0400-0410	Radio Thailand, Bangkok
0400-0410	RAI, Rome, Italy
0400-0415	Kol Israel, Jerusalem
0400-0420	Radio Botswana, Gabarone
0400-0420 T-S	Radio Zambia, Lusaka
0400-0425	Radio Bucharest, Romania
0400-0425	Radio Nederland, Hilversum
0400-0430	BBC, London, England
0400-0430	La Voz Evangelica, Honduras
0400-0430	Radio Berlin Int'l, East Germany
0400-0430	SLBC, Colombo, Sri Lanka
0400-0430	Radio Tanzania, Dar es Salaam
0400-0430	Swiss Radio Int'l, Berne
0400-0430 S,M	Trans World Radio, Bonaire
0400-0450	WINB, Red Lion, Pennsylvania
0400-0450	Deutsche Welle, West Germany
0400-0450	Radio Pyongyang, North Korea
0400-0455	Radio Beijing, China
0400-0500	CBC Northern Quebec Service
0400-0500	CBN, St. John's, Newfoundland
0400-0500	CBU, Vancouver, British Columbia
0400-0500	CFCF, Montreal, Quebec
0400-0500	CFCN, Calgary, Alberta
0400-0500	CHNS, Halifax, Nova Scotia
0400-0500	Christian Science World Service
0400-0500	CKWX, Vancouver, British Columbia
0400-0500	CRFB, Toronto, Ontario
0400-0500	(US) Far East Network, Tokyo
0400-0500	FEBC, Manila, Philippines
0400-0500	Radio Australia, Melbourne
0400-0500	Radio Havana Cuba
0400-0500	Radio Moscow, USSR
0400-0500	5965 9710 11760 11820
0400-0500	9765 11675 11690 11845
0400-0500	11850 12050 13645 13685
0400-0500	13710 15180 15230 15280



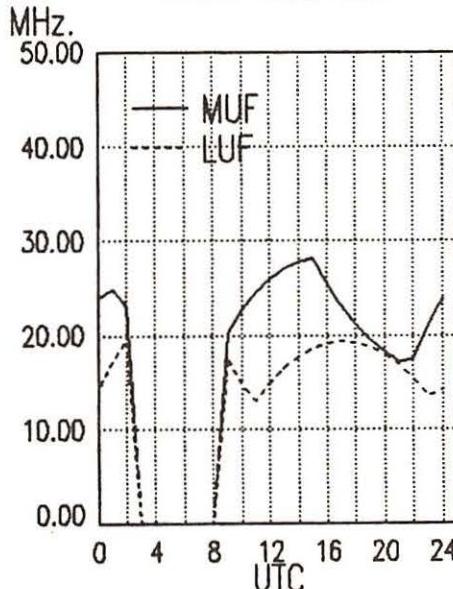
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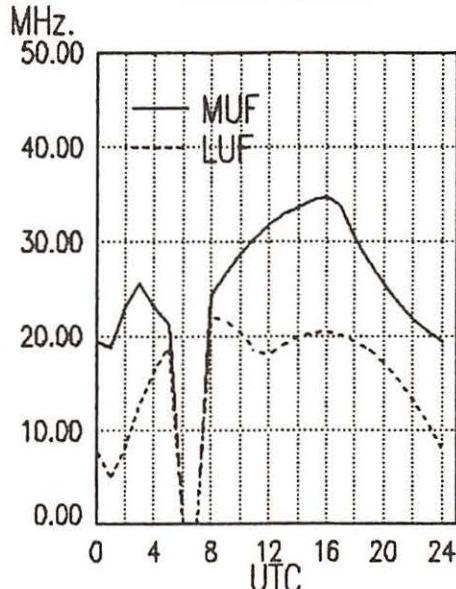
0400-0500	Radio Moscow North America Svc	15320 15480 17635 17860 17880 21585	9510 9600 9915 11940 12095 15070 15420 17740 17815 17885 21470
0400-0500	Radio New Zealand, Wellington	15405 15425 15540 15150 17705	5000-0600 CBC Northern Quebec Service 5000-0600 CBU, Vancouver, British Columbia 5000-0600 CFCF, Montreal, Quebec 5000-0600 CFCN, Calgary, Alberta 5000-0600 CHNS, Halifax, Nova Scotia 5000-0600 Christian Science World Service 5000-0600 CKWX, Vancouver, British Columbia 5000-0600 CFRB, Toronto, Ontario (US) Far East Network, Tokyo 5000-0600 FEBC, Manila, Philippines 5000-0600 HCJB, Quito, Ecuador 5000-0600 Radio 5, South Africa 5000-0600 Radio Australia, Melbourne 5000-0600 Radio Kuwait 5000-0600 Radio Moscow, USSR
0400-0500	Radio Tonga, Tonga	5050	6195 9625 6160 6005 6030 6130 9455 9870 13760 6080 6070 3910 11850 6230 9745 11775 4880 11880 15160 15240 15320 17715 17750 17795 21740 5965 11760 11820 15195 15270 17765 17810 17825 15345 9765 12050 13710 15180 15230 15280 15320 15425 15445 15540 17570 17600 17635 17860 17880 15150 17705 9655 11905 5050 11880 5052 11940 9630 6175 6155 9705 6035 7170 7200 7280 9540 9575 15205 6045 6100 7365 9495 9465 6185 5950 9520 5990 7275 9895 13700 3955 5975 6005 7185 9410 9510 9580 9915 11940 12095 15070 15280 15245 15420 17815 7210 9750 11945 9480 11835 9535 11930 3205 7205 15325 17820 (irr)
0400-0500	Radio 5, South Africa	4880 11880	5000-0600 Radio New Zealand, Wellington 5000-0600 Radio Thailand, Bangkok 5000-0600 Radio Tonga, Tonga 5000-0600 Radio Zambia, Lusaka 5000-0600 SBC Radio One, Singapore 5000-0600 Spanish Foreign Radio, Madrid 5000-0600 A,S Superpower KUSW, Utah 5000-0600 S Swaziland Commercial Radio 5000-0600 Voice of America, Washington
0400-0500	SBC Radio One, Singapore	5052 11940	6045 6100 7255 15120 15185 15145 7365 9495 9465 5950 11580 15566 17640 3356 4820 7255 6055 6140 7155 9740 9760 11840 15225
0400-0500 T-S	Superpower KUSW, Utah	11940 12095 15070 15280	5000-0600 IRR Voice of Kenya, Nairobi 5000-0600 Voice of Nicaragua, Managua 5000-0600 Voice of Nigeria, Lagos 5000-0600 WIN, Red Lion, Pennsylvania 5000-0600 WHRI, Noblesville, Indiana 5000-0600 M-A WMLK, Bethel, Pennsylvania 5000-0600 WYFR Satellite Net, California 5010-0520 Radio Botswana, Gaborone 5015-0530 M-F Radio Canada Int'l, Montreal
0400-0500	Voice of America, Washington	15195 15270 17765 17810	5000-0600 M-A WMLK, Bethel, Pennsylvania 5000-0600 WYFR Satellite Net, California 5010-0520 Radio Botswana, Gaborone 5015-0530 M-F Radio Canada Int'l, Montreal
0425-0440	RAI, Rome, Italy	5990 7275	5000-0600 Radio Havana Cuba 5000-0600 Radio Japan, Tokyo
0430-0455	Radio Netherlands, Hilversum	9895 13700	5000-0600 Radio Japan, Tokyo
0430-0500	BBC, London, England	3955 5975 6005 7185 9410 9510 9580 9915 11940 12095 15070 15280 15245 15420 17815 7210 9750 11945 9480 11835 9535 11930 3205 7205 15325 17820 (irr)	5000-0600 Radio Kuwait 5000-0600 Radio Moscow, USSR
0430-0500	BBC, London, England*	7210 9750 11945	5000-0600 Radio New Zealand, Wellington 5000-0600 Radio Thailand, Bangkok 5000-0600 Radio Tonga, Tonga 5000-0600 Radio Zambia, Lusaka 5000-0600 SBC Radio One, Singapore 5000-0600 Spanish Foreign Radio, Madrid 5000-0600 A,S Superpower KUSW, Utah 5000-0600 S Swaziland Commercial Radio 5000-0600 Voice of America, Washington
0430-0500	Radio Tirana, Albania	9480 11835	6045 6100 7255 15120 15185 15145 7365 9495 9465 5950 11580 15566 17640 3356 4820 7255 6055 6140 7155 9740 9760 11840 15225
0430-0500 S,M	Trans World Radio, Bonaire	9535 11930	5000-0600 Radio New Zealand, Wellington 5000-0600 Radio Thailand, Bangkok 5000-0600 Radio Tonga, Tonga 5000-0600 Radio Zambia, Lusaka 5000-0600 SBC Radio One, Singapore 5000-0600 Spanish Foreign Radio, Madrid 5000-0600 A,S Superpower KUSW, Utah 5000-0600 S Swaziland Commercial Radio 5000-0600 Voice of America, Washington
0430-0500	Trans World Radio, Swaziland	3205 7205	5000-0600 Radio New Zealand, Wellington 5000-0600 Radio Thailand, Bangkok 5000-0600 Radio Tonga, Tonga 5000-0600 Radio Zambia, Lusaka 5000-0600 SBC Radio One, Singapore 5000-0600 Spanish Foreign Radio, Madrid 5000-0600 A,S Superpower KUSW, Utah 5000-0600 S Swaziland Commercial Radio 5000-0600 Voice of America, Washington
0432-0500 A,M	FEBA, Seychelles	15325 17820 (irr)	5000-0600 Radio New Zealand, Wellington 5000-0600 Radio Thailand, Bangkok 5000-0600 Radio Tonga, Tonga 5000-0600 Radio Zambia, Lusaka 5000-0600 SBC Radio One, Singapore 5000-0600 Spanish Foreign Radio, Madrid 5000-0600 A,S Superpower KUSW, Utah 5000-0600 S Swaziland Commercial Radio 5000-0600 Voice of America, Washington

0500 UTC [1:00 AM EDT/10:00 PM PDT]

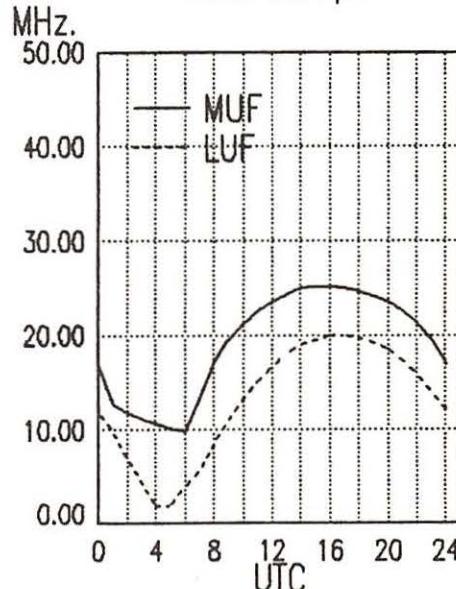
East Coast To
South East Asia



East Coast To
Indian Ocean



East Coast To
Artic Europe



East Coast

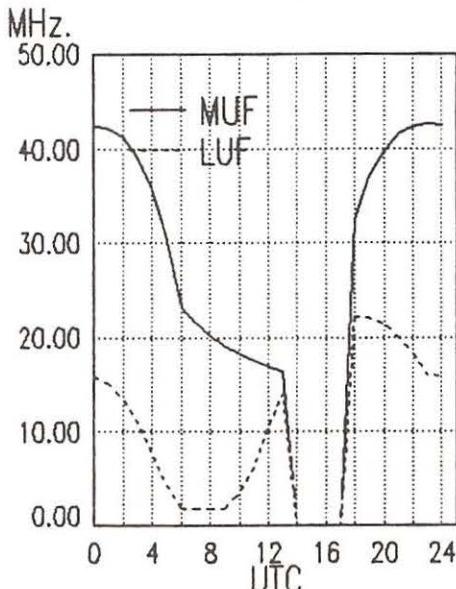
frequency

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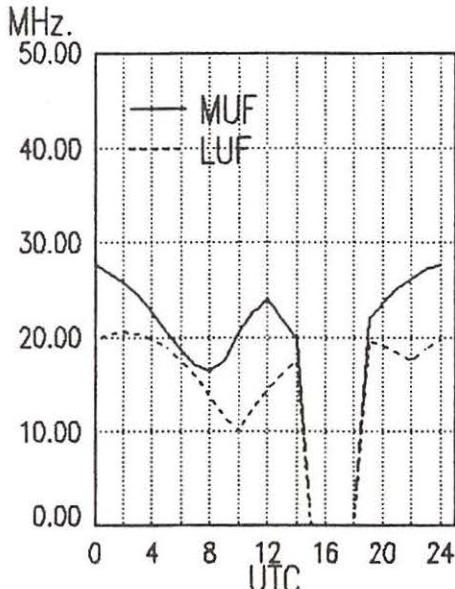
0515-0600		Radio Berlin Int'l, East Germany	15240	17880	21540	0600-0700	CFRB, Toronto, Ontario	6070
0527-0600	F	FEBA, Seychelles	17820			0600-0700	HCJB, Quito, Ecuador	6230
0530-0545		BBC, London, England*	3990	6050	6140 7210	0600-0700	(US) Far East Network, Tokyo	9745 11775
			9750			0600-0700	King of Hope, South Lebanon	3910
0530-0555		Radio Austria Int'l, Vienna	6015			0600-0700	Radio Havana Cuba	6215
0530-0555		Radio Bucharest, Romania	9640	11840	11940 15340	0600-0700	Radio Jordan, Amman	11835
			15380	17720		0600-0700	Radio Korea, Seoul, South Korea	9560
0530-0600		Radio Tirana, Albania	7300			0600-0700	Radio Kuwait	7275
0530-0600		Trans World Radio, Swaziland	5055	7210		0600-0700	Radio Moscow, USSR	9570 11830
0530-0600		UAE Radio, United Arab Emirates	15435	17775	21700	0600-0700	Radio New Zealand, Wellington	9765 13710 15135 15180
0545-0600		Radio Berlin Int'l, East Germany	15240	17800	21645	0600-0700	Radio Thailand, Bangkok	15405 15425 15480 17635
0545-0600	M-F	Radio Canada Int'l, Montreal	6055	6140	7155 9740	0600-0700	Radio Tonga, Tonga	17665 17570
0555-0600		Ghana Broadcasting Corp., Accra	4915			0600-0700	Radio Zambia, Lusaka	15150 17705
0555-0600		Voice of Malaysia, Kuala Lumpur	6175	9750	15295	0600-0700	Radio 5, South Africa	9655 11905
0600 UTC [2:00 AM EDT/11:00 PM PDT]								
0600-0615		Radio Ghana, Accra	3366	4915		0600-0700	SBC Radio One, Singapore	5052 11940
0600-0615	M-A	Radio Zambia, Lusaka	6165	7235		0600-0700	Superpower KUSW, Utah	6175
0600-0620		Vatican Radio, Vatican City	6185	9645		0600-0700	Voice of America, Washington	6035 6080 6125 7170
0600-0630	F	FEBA, Mahe, Seychelles	17820			0600-0700		7200 7280 7325 9530
0600-0630		Laotian National Radio	7113			0600-0700	Voice of Asia, Taiwan	9540 9550 11805
0600-0630		Radio Australia, Melbourne	11910	15160	15240 15395	0600-0700	Voice of Malaysia, Kuala Lumpur	6175 9750 15295
0600-0630			17715	17750	21740	0600-0700	Voice of Nicaragua, Managua	6100
0600-0630		Radio Berlin Int'l, East Germany	15240	17880	21645	0600-0700	Voice of the Mediterranean	9765
0600-0630		Trans World Radio, Swaziland	6070			0600-0700	Voice of Nigeria, Lagos	15185
0600-0630		Voice of Kenya, Nairobi	6045			0600-0700	WHRI, Noblesville, Indiana	9495 9620
0600-0645		Radio Berlin Int'l, East Germany	5965	11810		0600-0700	M-A WMLK, Bethel, Pennsylvania	9465
0600-0645	S	Radio Cameroon, Yaounde	4850			0600-0700	WYFR, Oakland, California	13760 15566
0600-0650		Deutsche Welle, West Germany	11765	13790	15185 17875	0600-0700	WYFR Satellite Net, California	5950 6065 7355 9852.5
0600-0650		Radio Pyongyang, North Korea	13650	15160	15180	0615-0630	M-A Vatican Radio, Vatican City	17640
0600-0700		BBC, London, England	5975	6005	6195 7150	0625-0700	Trans World Radio Monte Carlo	15190 17730
			9410	9580	9600 9610	0630-0635	M-F RTVC, Brazzaville, Congo	7105
			9640	9760	11925	0630-0700	AWR, Forli, Italy	15190 irr
			11940			0630-0700	Radio Australia, Melbourne	7125
			12095	15070	15280 21470	0630-0700	Radio Bucharest, Romania	11910 15160 15240 15395
0600-0700		CBC Northern Quebec Service	6195	9625		0630-0700	Radio Finland, Helsinki	17715 17750 21740
0600-0700		CBU, Vancouver, British Columbia	6160			0630-0700	Radio Polonia, Warsaw, Poland	21600
0600-0700		CFCF, Montreal, Quebec	6005			0630-0700	Swiss Radio Int'l, Berne	6120 9560 11755 15270
0600-0700		CFCN, Calgary, Alberta	6030			0630-0700	Trans World Radio, Swaziland	6135 7270 15120
0600-0700		CHNS, Halifax, Nova Scotia	6130			0630-0700	A.S Voice of Kenya, Nairobi	3985 6165 9535 12030
0600-0700		Christian Science World Service	9455	9840	11980	0645-0700	BBC, London, England*	15430 17570
0600-0700		CKWX, Vancouver, British Columbia	6080					5055 6070 7210 9725
								7270
								6150 7260 11945

East Coast To
Pacific

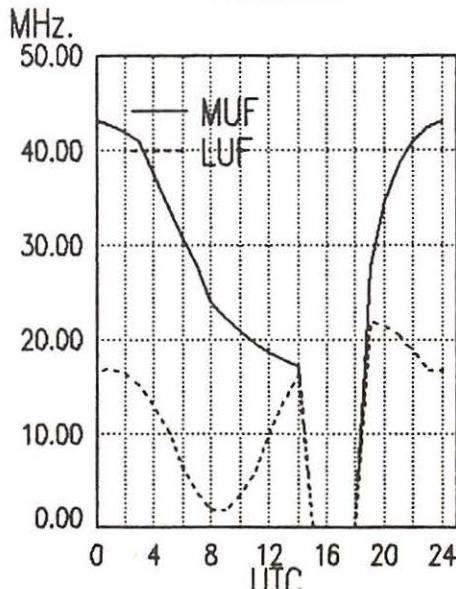
East Coast



East Coast To
Far East



East Coast To
Australia



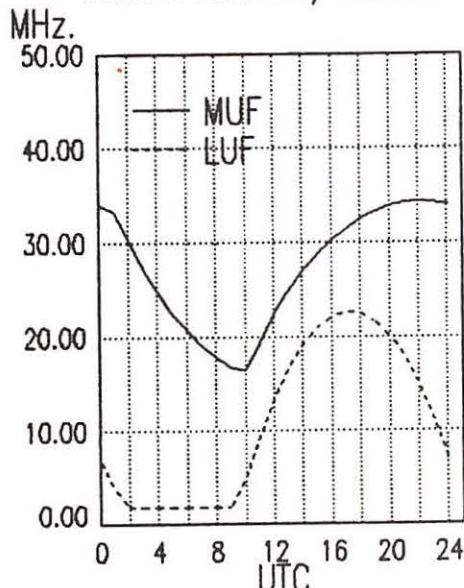
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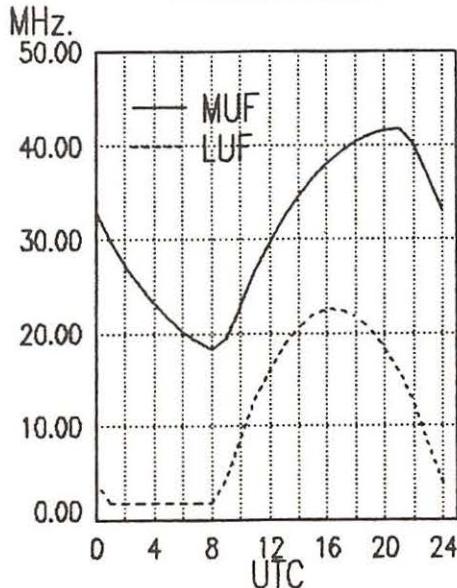
0645-0700	Radio Ghana, Accra	6130
0645-0700	Radio Bucharest, Romania	11940 15250 15335 17790 17805 21665

0700-0800	Radio Moscow, USSR	9765 11845 13710 15135 15480 15540 17760
0700-0800 A,S	Radio Thailand, Bangkok	9655 11905
0700-0800	Radio Tonga, Tonga	5050
0700-0800	SBC-1, Singapore	5052 11940
0700-0800 S	Solomon Islands Broadcasting Corp Superpower KUSW, Utah	9545 6135
0700-0800	Trans World Radio, Monte Carlo	9485
0700-0800	Trans World Radio, Swaziland	6070 9725
0700-0800	Voice of America, Washington	6020
0700-0800	Voice of Free China, Taiwan	5985
0700-0800 A,S	Voice of Kenya, Nairobi	7270
0700-0800	Voice of Malaysia, Kuala Lumpur	6175 9750 15295
0700-0800	Voice of Nigeria, Lagos	15120 15185
0700-0800 M-A	WMLK, Bethel, Pennsylvania	9455
0700-0800	WYFR, Oakland, California	6065 7355 9852.5
0700-0800	WYFR Satellite Network	13760
0715-0730	Radio Korea, Seoul, South Korea	13670 15575
0715-0730 M-A	Vatican Radio, Vatican City	11725 15190
0715-0735 S	FEBA, Mahe, Seychelles	15115 17785
0715-0800	Radio Berlin Int'l, East Germany	6040 7185 9730 21465 21540
0720-0730 M-A	Vatican Radio, Vatican City	6248 9645 11740
0730-0735	All India Radio, New Delhi	5990 6010 6020 7110 7205 9610 9675 11850
0730-0800	ABC, Alice Springs, Australia	11935 15235 15250 17705 2310 [ML]
0730-0800	ABC, Katherine, Australia	2485
0730-0800	ABC, Tennant Creek, Australia	2325 [ML]
0730-0800	Radio Australia, Melbourne	5955 15160 15395 17715
0730-0745	BBC, London, England*	3975 6010 7230 9915
0730-0755	Radio Austria Int'l, Vienna	6155 13730 15410 21490
0730-0755	Radio Finland, Helsinki	6120 9560 11755
0730-0800	AWR, Forlì, Italy	7125
0730-0800	BBC, London, England	3955 7150 7325 9410 9600 9640 9760 11860
0730-0800		11940 12095 15070 15280 15400 21470
0730-0800	Radio Netherland, Hilversum	9630 9715
0730-0800	Radio Prague, Czechoslovakia	11685 17840 21705
0730-0800	Swiss Radio Int'l, Berne	3985 6165 9535
0730-0800 W	WHRI, Noblesville, Indiana	9495 9620
0740-0750 W	Radio Free Europe, Munich*	5985 7115 9695 9725
		11895 15355

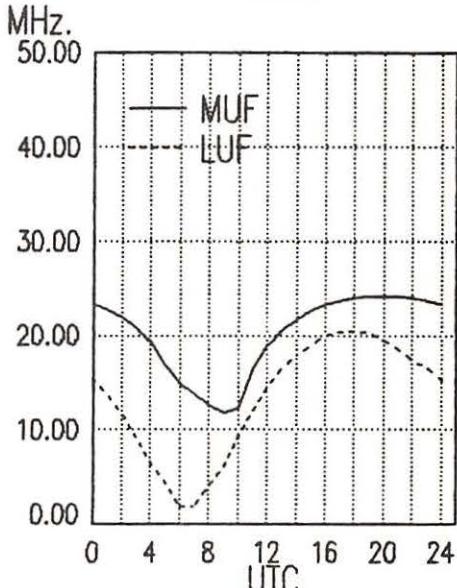
East Coast To
Central America/Caribbean



East Coast To
South America



East Coast To
Alaska



East Coast

frequency

section

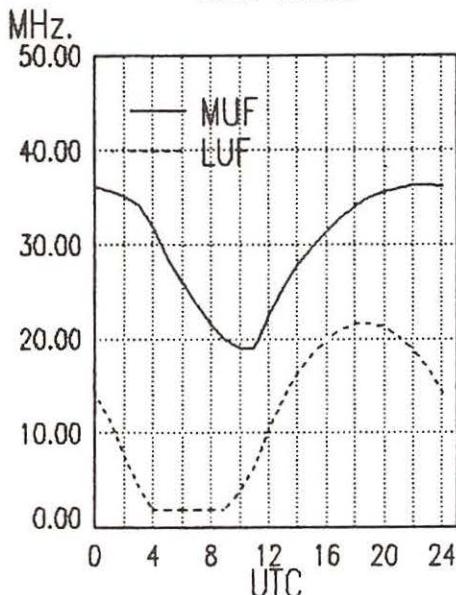
0745-0800	Radio Berlin Int'l, East Germany	6040 6115 7185 9730
		21465 21540
0755-0800	Radio Pacific Okean, USSR	17605

0800 UTC [4:00 AM EDT/1:00 AM PDT]

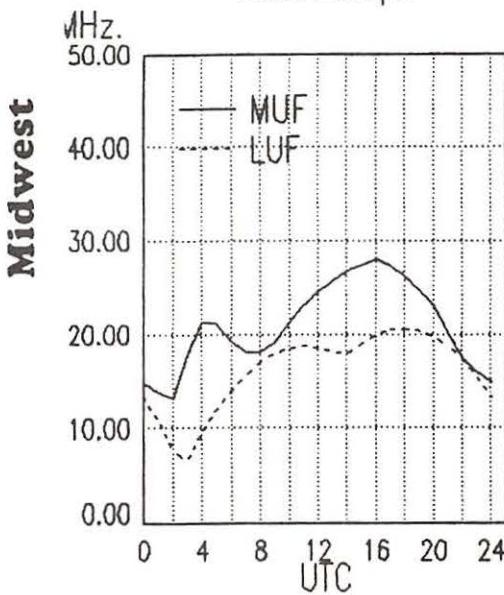
0800-0805 M-F	Port Moresby, Papua New Guinea	3925 4890 5960 5985
		6020 6040 6080 6140
		9520
0800-0805	Soloman Islands Broadcasting Corp	9545
0800-0815 M-A	Radio Zambia, Lusaka	6165 7235
0800-0825 M-A	Radio Finland, Helsinki	17795 21550
0800-0825	Radio Netherland, Hilversum	9630 9715
0800-0825	Voice of Malaysia, Kuala Lumpur	6175 9750 15295
0800-0830	HCJB, Quito, Ecuador	6130 9610 9745 11835
		11925
0800-0830 S	Radio Austria Int'l, Vienna	6155 13730 15410 15450
0800-0830	Radio Bangladesh, Dhaka	12030 15525
0800-0830	Radio Berlin Int'l, East Germany	6040 6115 7185 9730
		21465 21540
0800-0830 S	Radio Norway, Oslo	15165 21730
0800-0830	Radio Tirana, Albania	9500 11835
0800-0830	Voice of Nigeria, Lagos	7255 15185
0800-0830	Voice of Islam, Pakistan	15525 17870
0800-0835 S	FEBA, Mahe, Seychelles	15325, 17785
0800-0835	Trans World Radio, Swaziland	6070 9725
0800-0840	Trans World Radio, Monte Carlo	9485
0800-0850	Deutsche Welle, West Germany	9770
0800-0850	Radio Pyongyang, North Korea	11830 15115 15160 15180
0800-0900	ABC, Alice Springs, Australia	2310 [ML]
0800-0900	ABC, Katherine, Australia	2485
0800-0900	ABC, Perth, Australia	15425
0800-0900	ABC, Tennant Creek, Australia	2325 [ML]
0800-0900	AFAN, Antarctica	6010.5
0800-0900	BBC, London, England	7150 9410 9640 9760
		11860 11940 12095 15280
		15360 15070 15400 17815
		15240
0800-0900	CBN, St. John's, Newfoundland	6160
0800-0900	CBU, Vancouver, British Columbia	6160
0800-0900	CFCF, Montreal, Quebec	6005
0800-0900	CFCN, Calgary, Alberta	6030
0800-0900	CHNS, Halifax, Nova Scotia	6130

0800-0900	Christian Science World Service	9455 17855
	CKWX, Vancouver, British Columbia	6080
0800-0900	CFRB, Toronto, Ontario	6070
0800-0900	(US) Far East Network, Tokyo	3910
0800-0900	King of Hope, South Lebanon	6215
0800-0900	KNLS, Anchor Point, Alaska	6065
0800-0900	Radio Australia, Melbourne	5995 9580 9655 9710
		11720 11750 11770 15395
		17715
0800-0900	Radio Jordan, Amman	11955
0800-0900	Radio Moscow, USSR	12030 15135 15535 15580
		15585 17570 17660 21585
		21800
0800-0900	Radio for Peace, Costa Rica	12030
0800-0900	Radio Tongo, Tonga	5050
0800-0900	SBC Radio One, Singapore	5052 11940
0800-0900 S	Superpower KUSW, Utah	6135
0800-0900	Voice of Indonesia, Jakarta	11790 15105
0800-0900 A,S	Voice of Kenya, Nairobi	7270
0805-0900	KTWR, Guam	15210
0815-0845 M-F	Voice of America, Washington DC	7175 9575 9750 11710
		11915 15600 17715 21500
	[ML]	
0830-0840	All India Radio, New Delhi	5960 5990 6010 6020
		6050 6065 6100 6140
		7110 7140 7160 7250
		7280 7295 9610 11850
		15235 15250 17705
0830-0900 S	Bhutan Broadcasting Service, Thimpu	6035
0830-0900	FEBC, Manila, Philippines	11850 15350
0830-0900	HCJB, Quito, Ecuador	6130 9745 11925
0830-0900	Radio Beijing, China	9700 11755 15440
0830-0855	Radio Finland, Helsinki	15245 17795
0830-0900	Radio Netherlands, Hilversum	17575 21485
0830-0900	Radio Prague, Czechoslovakia	11685 17840 21705
0830-0900	Swiss Radio Int'l, Berne	9560 9885 13685 17830
		21695
0830-0900	Voice of Nigeria, Lagos	7255 15120
0840-0850 M-A	Voice of Greece, Athens	9855 15630
0840-0900 S-F	Trans World Radio, Monte Carlo	7105
0845-0900	Radio Prague, Czechoslovakia	6055 7345 9505
0850-0900	All India Radio, New Delhi	5960 5990 6010 6020
		6050 6065 6100 6140
		7110 7140 7150 7160
		7250 7280 7295 9610

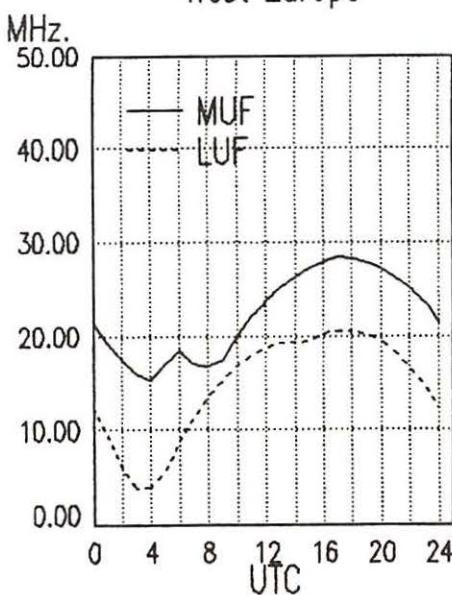
East Coast To
West Coast



Midwest To
East Europe



Midwest To
West Europe

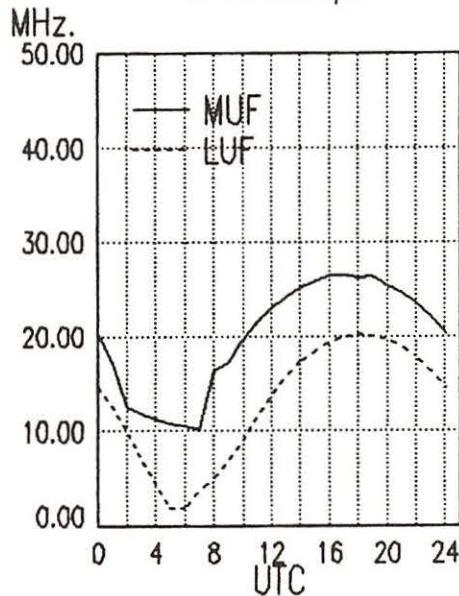


frequency

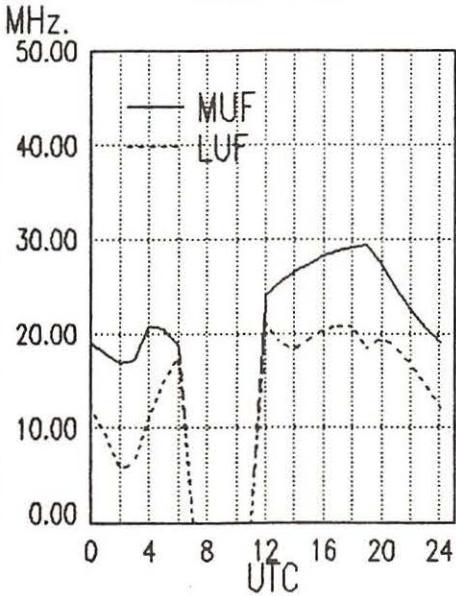
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0850-0900	Radio Korea, Seoul	11850 15235 15250 17705 13670	0900-1000	Radio Australia, Melbourne	5995 6080 9580 9655 9710 9760 11720 11770 15415
0900 UTC [5:00 AM EDT/2:00 AM PDT]					
0900-0910	All India Radio, New Delhi	5960 5990 6010 6020 6050 6065 6100 6140 7110 7140 7150 7160 7250 7280 7295 9610 11850 15235 15250 17705	0900-1000	Radio Japan, Tokyo	11840 11885 15270 17810 17890
0900-0910	Trans World Radio, Monte Carlo	7105	0900-1000	Radio Korea, Seoul, South Korea	7550 13670
0900-0910	Voice of Lebanon, Beirut	6548	0900-1000	Radio Moscow, USSR	15135 15535 15540 15580 17570 17660 21585
0900-0925	BRT, Brussels, Belgium	5915 17595 21810 26050	0900-1000	Radio New Zealand, Wellington	9850
0900-0925	Radio Netherlands, Hilversum	17575 21485	0900-1000	Radio for Peace, Costa Rica	13660
0900-0930	FEBC, Manila, Philippines	11850 15350	0900-1000	S Radio Prague, Czechoslovakia	6055 7345 9505 [ML]
0900-0930	KTWR, Agana, Guam	15210	0900-1000	Radio RSA, South Africa	11805
0900-0930	Nippon Broadcasting Corp.	3925	0900-1000	Radio Tanzania, Dar es Salaam	7165
0900-0930	Radio Beijing, China	9700 11755	0900-1000	Radio Tonga, Tonga	5050
0900-0930	Radio Norway, Oslo	17840	0900-1000	SBC Radio One, Singapore	5010 5052 11940
0900-0930 A,S	Radio Prague, Czechoslovakia	11685 17840 21705	0900-1000	Superpower KUSW, Utah	6135
0900-0945	Radio Berlin Int'l, East Germany	9770 11890 21540	0900-1000	Voice of America, Washington	5985 6030 6130 9560 11720
0900-0950	Deutsche Welle, West Germany	6160 9650 11785 11945 17780 21650	0900-1000	Voice of Kenya, Nairobi	7270
0900-1000	ABC, Alice Springs, Australia	2310 [ML]	0900-1000	Voice of Nigeria, Lagos	7255 15120 15185
0900-1000	ABC, Katherine, Australia	2485	0900-1000	WHRI, Noblesville, Indiana	7355 9495
0900-1000	ABC, Tennant Creek, Australia	2325 [ML]	0900-1000	WYFR, Oakland, California	5950 11580
0900-1000 S	Adventist World Radio, Portugal	9670	0915-0930	Radio Korea, Seoul, South Korea	9570
0900-1000	BBC, London, England	9410 9740 9750 11750 11845 11860 11940 11955 12095 15070 15175 15280 15360 15400 17705 17640 17790 17815 21470	0915-0950 M-A	Radio Ulan Bator, Mongolia	9615 12015
0900-1000	CFCF, Montreal, Quebec	6005	0930-0935	Radio Ulan Bator, Mongolia	5960 5990 6010 6020
0900-1000	CFCN, Calgary, Alberta	6030	0930-0945	Voice of Nigeria, Lagos	6050 6065 6100 6140
0900-1000	CHNS, Halifax, Nova Scotia	6130	0930-1000	WHRI, Noblesville, Indiana	7110 7140 7160 7250
0900-1000	Christian Science World Service	9455 17855	0930-1000	WYFR, Oakland, California	7280 7295 9610 11850
0900-1000	CKWX, Vancouver, British Columbia	6080	0930-1000	Radio Korea, Seoul, South Korea	15235 15250 17705
0900-1000	CFRB, Toronto, Ontario	6070	0930-1000	Radio Ulan Bator, Mongolia	9725 11955
0900-1000	(US) Far East Network, Tokyo	3910	0930-1000	Voice of Kenya, Nairobi	6160
0900-1000	HCJB, Quito, Ecuador	6130 9745 11925	0930-1000	Radio Beijing, China	9700 11755 15440
0900-1000	King of Hope, South Lebanon	6215	0930-1000	Radio New Zealand, Wellington	9850
0900-1000	KNLS, Anchor Point, Alaska	6065	0930-1000	Radio Sweden Int'l, Stockholm	15390
0900-1000	KYOT, Salpan	11900	0945-1000 M-A	Radio Prague, Czechoslovakia	5995 7180 9725 11955
0900-1000	Radio Afghanistan, Kabul	4450 6085 15435 17720	0945-1000	Radio Berlin Int'l, East Germany	6115
1000 UTC [6:00 AM EDT/3:00 AM PDT]					
1000-1030	HCJB, Quito, Ecuador	6130 9745 11925	1000-1030	Radio Afghanistan, Kabul	4450 6085 15435 17720
1000-1030	Kol Israel, Jerusalem	15650 17575 21760	1000-1030	Radio Beijing, China	11755 15440 17710

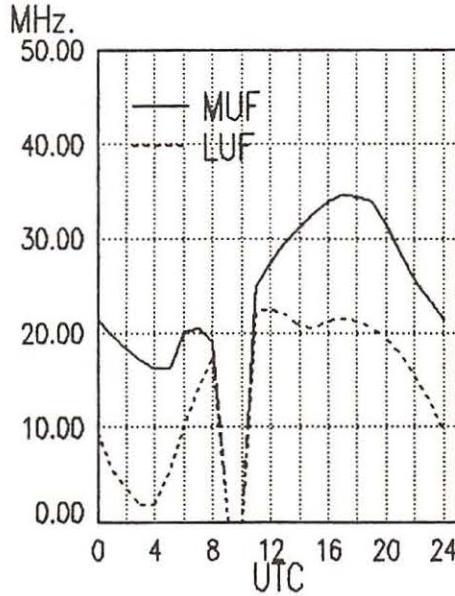
Midwest To
Arctic Europe



Midwest To
East Africa



Midwest To
Central Africa

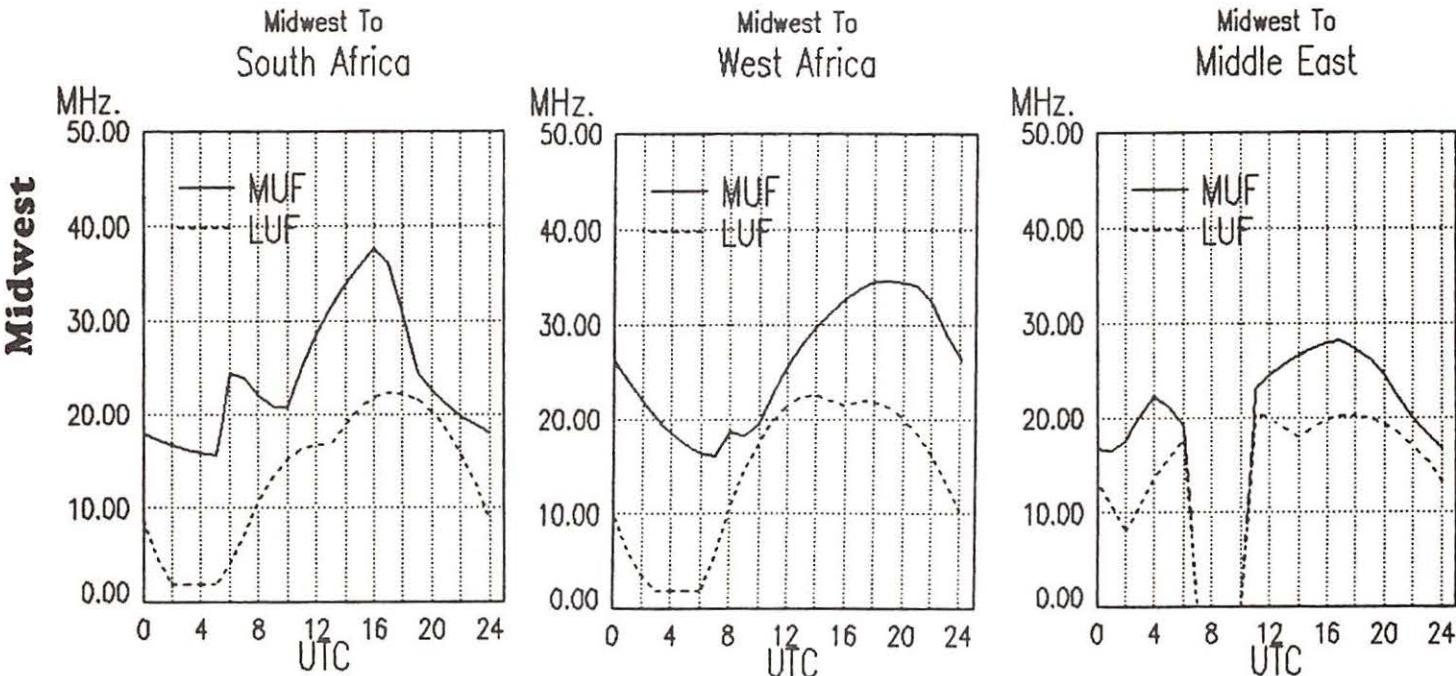


Midwest

frequency

section

1000-1030	Radio Berlin Int'l, East Germany	6115	1000-1100	Voice of Nigeria, Lagos	7255 15120
1000-1030 S	Radio Norway Int'l, Oslo	15235 21705 25730	1000-1100	WHRI, Noblesville, Indiana	7355
1000-1030	Radio Tanzania, Dar es Salaam	7165	1000-1100	WYFR, Oakland, California	5950 17530
1000-1030	Swiss Radio Int'l, Berne	9560 13685 17670 21695	1005-1010	Radio Pakistan, Islamabad	15606 17660
1000-1030	Voice of Ethiopia, Addis Ababa	9560	1030-1040	Voice of Asia, Taiwan	5980
1000-1030	Voice of Vietnam, Hanoi	9840 15010	1030-1045 A	Radio Budapest, Hungary	7220 9585 9835 11910
1000-1055 A	Trans World Radio, Monte Carlo	7105	1030-1055	Radio Austria Int'l, Vienna	15160 15220
1000-1100	ABC, Alice Springs, Australia	2310 [ML]	1030-1100	BBC, London, England*	15450 21490
1000-1100	ABC, Katherine, Australia	2485	1030-1100	HCJB, Quito, Ecuador	7180 9660 9725
1000-1100	ABC, Perth, Australia	9610	1030-1100	Radio Netherlands, Hilversum	6130 11925
1000-1100	ABC, Tennant Creek, Australia	2325 [ML]	1030-1100 A.S	Radio Tanzania, Dar es Salaam	6020 9675
1000-1100	All India Radio, New Delhi	11860 11915 15130 15335	1030-1100	SLBC, Colombo, Sri Lanka	7165
1000-1100	BBC, London, England	17387 11785	1030-1100	UAE Radio, United Arab Emirates	11835 15120 17850 [ML]
		9410 9740 11750 11940	1030-1100	Voice of America, Washington*	15320 15435 17865 21605
		12095 15070 15360 17640	1040-1050 H	Radio Free Europe, Munich*	11965
		17705 17790 17830 21470	1040-1050	Radio Free Europe, Munich*	7115 9695 9725
		25750	1040-1050 M-A	Voice of Greece, Athens	11895 15355
1000-1100	CBN, St. John's, Newfoundland	6160	1045-1100 S	Radio Budapest, Hungary	11645 15630
1000-1100	CFCF, Montreal, Quebec	6005	1045-1100 M-A	Radio Prague, Czechoslovakia	7220 9585 9835 11910
1000-1100	CFCN, Calgary, Alberta	6030	1055-1100 S	Trans World Radio, Monte Carlo	15160 15220
1000-1100	CHNS, Halifax, Nova Scotia	6130			6055 7345 9505
1000-1100	Christian Science World Service	9455			7105
1000-1100	CKWX, Vancouver, British Columbia	9495			
1000-1100	CFRB, Toronto, Ontario	6080			
1000-1100	(US) Far East Network, Tokyo	6070			
1000-1100	FEBC, Manila, Philippines	3910			
1000-1100	KSDA, Guam	11850			
1000-1100	KTWR, Agana, Guam	13720			
1000-1100	KYOL, Saipan	11805			
1000-1100	Radio Afghanistan, Kabul	9530			
1000-1100	Radio Australia, Melbourne	15435 17720			
		5955 5995 6020 7205			
		9580 9655 9710 9655			
		9770 15415			
1000-1100	Radio Moscow, USSR	9600 15110 15130 15405			
		15420 15520 15535 15550			
		15585 15590 17660 17815			
		17830 21800			
1000-1100	Radio New Zealand, Wellington	9850 11780			
1000-1100 S	Radio Prague, Czechoslovakia	6055 7345 9505 [ML]			
1000-1100	Radio RSA, South Africa	11805			
1000-1100	SBC Radio One, Singapore	5010 5052 11940			
1000-1100 S	Superpower KUSW, Utah	6135			
1000-1100	Voice of America, Washington	6030 5985 6165 9530			
		9590 11720 15425			
1000-1100	Voice of Kenya, Nairobi	7270			

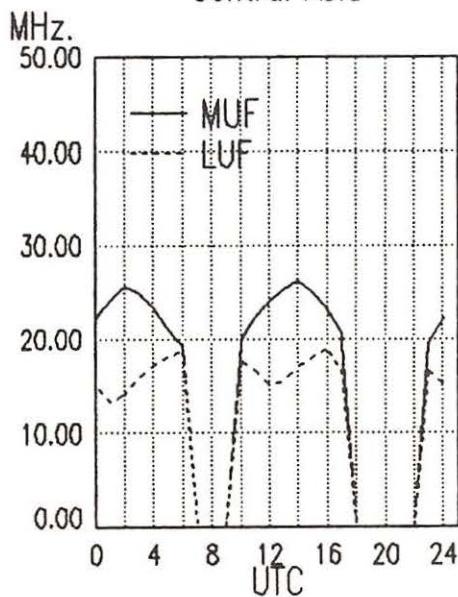


frequency

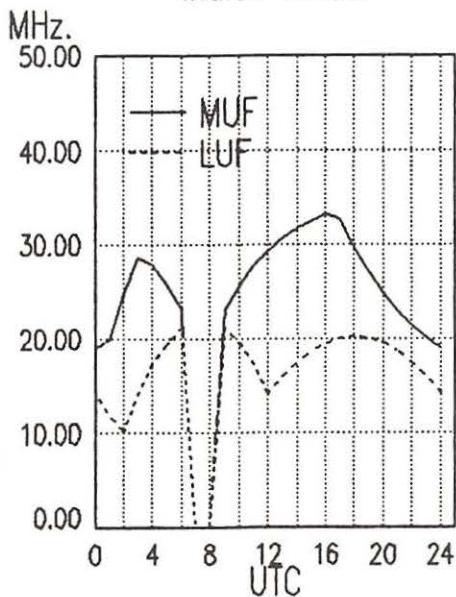
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1100-1200	ABC, Perth, Australia	9610	1130-1200	Radio Berlin Int'l, East Germany	15440	17880	21465	21540
1100-1200	ABC, Tennant Creek, Australia	2325 [ML]	1130-1200	Radio Netherland, Hilversum	5955	9715	17575	21480
1100-1200	BBC, London, England	5965 6195 7180 9410	1130-1200	Radio Thailand, Bangkok	9655	11905		
		9515 9740 9750 9760	1130-1200	Radio Tirana, Albania	9480	11855		
		11750 11940 15070 15360	1130-1200	Voice of Islamic Republic Iran	7230	9520	9685	11790
		15420 17640 17790 21710	1135-1140	All India Radio, New Delhi	6065	7110	9610	9675
1100-1200	CBC Northern Quebec Service	6065 9625	1140-1145	M-A Vatican Radio, Vatican City	11850	15320		
1100-1200	CBN, St. John's, Newfoundland	6160	1145-1200	BBC, London, England*	6248	9645	11740	
1100-1200	CFCF, Montreal, Quebec	6005	1145-1200	Radio Bangladesh, Dakha	7180	15280		
1100-1200	CFCN, Calgary, Alberta	6030	1145-1200	Radio Prague, Czechoslovakia	15255	17740		
1100-1200	CHNS, Halifax, Nova Scotia	6130			6055	7345	9505	
1100-1200	Christian Science World Service	9455 9495						
1100-1200	CKWX, Vancouver, British Columbia	6080						
1100-1200	CFRB, Toronto, Ontario	6070						
1100-1200	(US) Far East Network, Tokyo	3910						
1100-1200	KYOL, Saipan	9530						
1100-1200	Radio Australia, Melbourne	5995 6020 6060 6080	1200-1215	BBC, London, England*	3915	6065	7275	
		7205 7215 9580 9645	1200-1215	Radio Berlin Int'l, East Germany	15440	17880	21465	21540
		9710 9770	1200-1215	Vatican Radio, Vatican City	17865	21515		
1100-1200	Radio Japan, Tokyo	6120 11815	1200-1215	Voice of Kampuchea, Phnom-Penh	9693	11938		
1100-1200	Radio Moscow, USSR	9600 15135 15220 15520	1200-1220	Radio Bucharest, Romania	17720	21665		
1100-1200	Radio RSA, South Africa	17645 17660 17890 21800	1200-1225	M-F Radio Finland, Helsinki	15400	21550		
1100-1200 A,S	Radio Tanzania, Dar es Salaam	11805 11900 21590	1200-1225	Radio Japan, Tokyo	12110			
1100-1200 S	Radio Zambia, Lusaka	7165	1200-1225	Radio Polonia, Warsaw, Poland	6095	7285		
1100-1200 S	SBC-1, Singapore	11880 [IRR]	1200-1230	Radio Nederland, Hilversum	5955	9715	17575	21480
1100-1200 S	Superpower KUSW, Utah	5010 5052 11940	1200-1230		21520			
1100-1200	Voice of America, Washington	9850	1200-1230					
		5985 6110 6165 9590	1200-1230	Radio Norway, Oslo	15325			
		9660 9760 11720 11745	1200-1230	Radio Somalia, Mogadishu	6095			
		15425	1200-1230	Radio Tashkent, Uzbek, USSR	9540	9600	11785	15460
1100-1200	Voice of Asia, Taiwan	5980 7445	1200-1230	Radio Thailand, Bangkok	9655	11905		
1100-1200	Voice of Kenya, Nairobi	7270	1200-1230	Radio Yugoslavia, Belgrade	11735	15325	15380	17740
1100-1200	Voice of Nigeria, Lagos	7255 15120	1200-1230		21555	25795		
1100-1200	WHRI, Noblesville, Indiana	9465 11790	1200-1230	Radio Zambia, Lusaka	11880 [IRR]			
1100-1200	WYFR, Oakland, California	5950 11580 17530 17640	1200-1230	Swiss Radio In'yI, Berne	6165	9535	12030	
1110-1120 M-F	Radio Botswana, Gaborone	4820 5955 7255	1200-1235	M-A Radio Ulan Bator, Mongolia	9615	12015		
1115-1130	Radio Korea, Seoul, South Korea	11740	1200-1255	Radio Beijing, China	11600	11660	15400	15540
1115-1130	Vatican Radio, Vatican City	17840 21485	1200-1300	ABC, Alice Springs, Australia	17855			
1115-1145	Radio Nepal, Kathmandu	5005	1200-1300	ABC, Katherine, Australia	2310 [ML]			
1115-1200	Trans World Radio, Bonaire	11815 15345	1200-1300	ABC, Perth, Australia	2485			
1130-1145 A	Radio Budapest, Hungary	7220 9585 9835 11910	1200-1300	ABC, Tenant Creek, Australia	9660			
1130-1155	Radio Austria Int'l, Vienna	15160 15220	1200-1300	S Adventist World Radio, Africa	2325 [ML]			
1130-1200	HCJB, Quito, Ecuador	6155 13730 15450 17870	1200-1300	AFAN, Antarctica	17890			
		11740	1200-1300	BBC, London, England	6012			
			1200-1300		6195	9510	9740	11750
					11775	11940	12095	15070

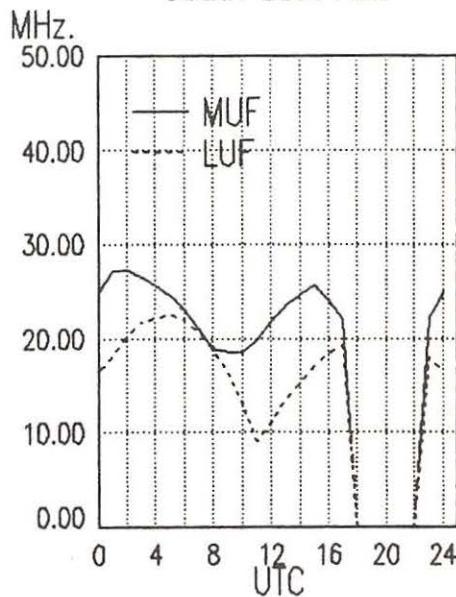
Midwest To
Central Asia



Midwest To
Indian Ocean



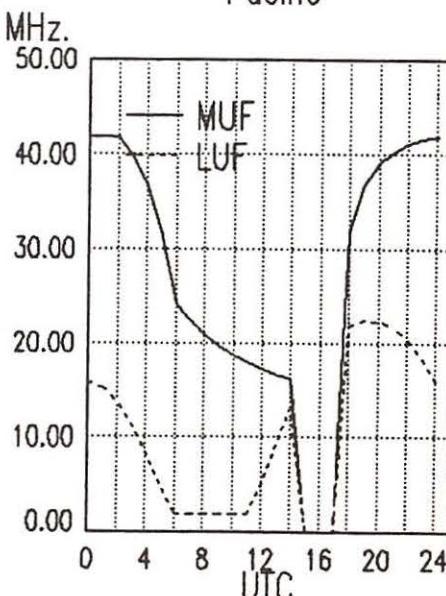
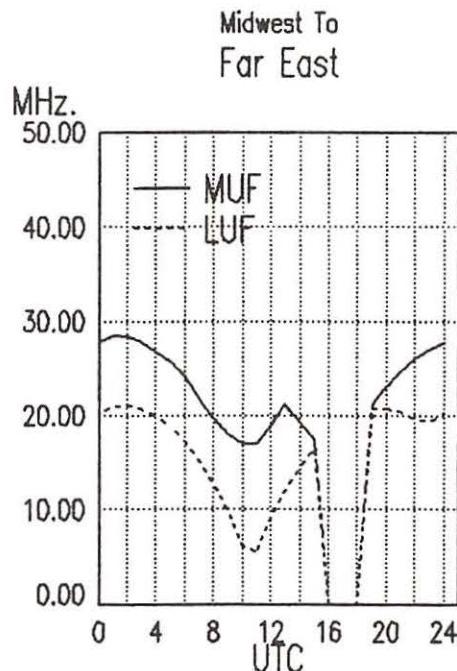
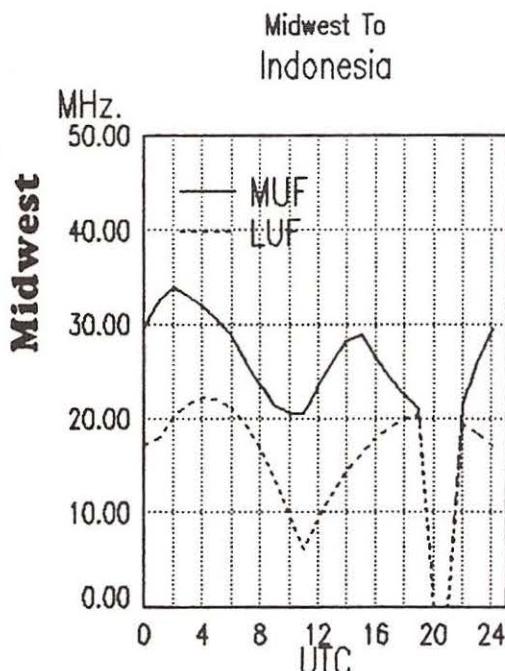
Midwest To
South East Asia



Midwest

frequency

Section



frequency

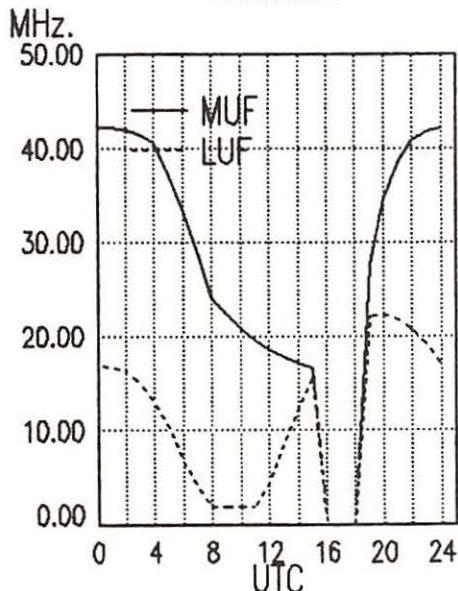
section

1300-1400	S	ELWA, Monrovia, Liberia	11830
1300-1400		(US) Far East Network, Tokyo	3910
1300-1400		FEBC, Manila, Philippines	11850
1300-1400		HCJB, Quito, Ecuador	11740 15115 17890
1300-1400		KNLS, Anchor Point, Alaska	7355
1300-1400		Radio Australia, Melbourne	5995 6060 6080 7205 9580
1300-1400	S-F	Radio Canada Int'l, Montreal	9625 11720 11955 17820
1300-1400		Radio Jordan, Amman	9560
1300-1400		Radio Korea (South), Seoul	9750 15575
1300-1400		Radio Moscow, USSR	11840 11900 11955 12050 13710 15220 15540 15320 15490 15550 15595 17570 17645 17815 17830 21630 21725
1300-1400		Radio RSA, South Africa	11805 17730 21590
1300-1400	A,S	Radio Tanzania, Dar es Salaam	7165
1300-1400		SBC Radio One, Singapore	5010 5052 11940
1300-1400	A,S	Superpower KUSW, Utah	9850
1300-1400		Voice of America, Washington	6110 9760 11715 15155 15160 15425
1300-1400		Voice of Malaysia	7295
1300-1400		Voice of Nigeria, Lagos	7255 15120
1300-1400		WHRI, Noblesville, Indiana	9465 11790
1300-1400		WYFR, Oakland, California	5950 6010 9680 11580 11830 13695 15055 15215 15365
1330-1345		Radio Korea, Seoul, South Korea	7275 11740
1330-1400		BBC, London, England	5995 6195 7180 9410 9740 11750 11940 15070 15140 15310 17640 17790
1330-1400		All India Radio, New Delhi	17885 21470 21710 25750
1330-1400		Laotian National Radio	9545 10330 11810 15335
1330-1400	S	Radio Finland, Helsinki	7113
1330-1400		Radio Tashkent, Uzbek, USSR	15400 21550 5945 9540 9600 11785 15455
1330-1400		Swiss Radio Int'l, Berne	9620 11695 13635 15135 15570 17830 21695
1330-1400		UAE Radio, United Arab Emirates	15435 17865 21605
1330-1400		Voice of Islamic Republic Iran	9525 9685 9770
1330-1400		Voice of Kenya, Nairobi	6100
1330-1400		Voice of Vietnam, Hanoi	12010 15010
1332-1400	A	Trans World Radio, Bonaire	11815 15345
1345-1400		Radio Berlin Int'l, East Germany	9730

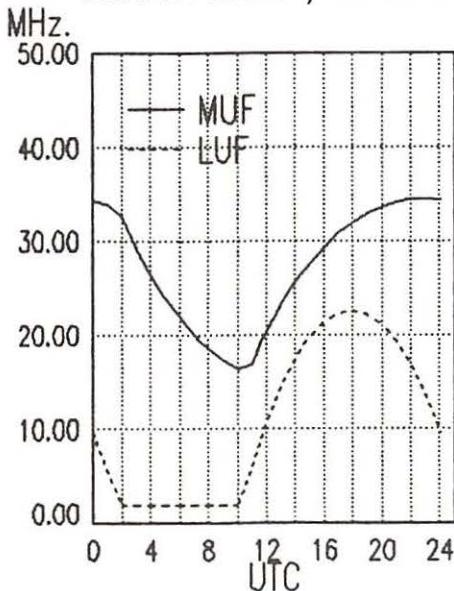
1400 UTC [10:00 AM EDT/7:00 AM PDT]

1400-1427	Voice of Nigeria, Lagos	15120
1400-1430	ABC, Alice Springs, Australia	2310 [ML]
1400-1430	ABC, Tennant Creek, Australia	2325 [ML]
1400-1430	Radio Finland, Helsinki	9560 11715 11925 15185 17800
1400-1430	Radio France Int'l, Paris	21780
1400-1430	S Radio Norway Int'l, Oslo	15190 21705 25730
1400-1430	Radio Polonia, Warsaw, Poland	6095 7285
1400-1430	R. Station Peace & Progress USSR	11890 15220 17610 17635 17645
1400-1430	Radio Sweden Int'l, Stockholm	17705 21610
1400-1430	Radio Tirana, Albania	9500 11985
1400-1430	Voice of Ethiopia, Addis Ababa	9550 11710
1400-1450	T Radio Free Europe, Munich*	5985 7115 7695 9725 11895 15355
1400-1450	Radio Pyongyang, North Korea	6576 11735
1400-1455	Radio Beijing, China	7405 11600 11855 15165
1400-1500	ABC, Katherine, Australia	2485
1400-1500	ABC, Perth, Australia	9610
1400-1500	Adventist World Radio, Italy	7275
1400-1500	All India Radio, New Delhi	9545 11810 15335
1400-1500	BBC, London, England	5995 6195 7180 9740 9750 11750 12095 15070 15310 15400 17705 17640 17790 17840 21710 21470 25750
1400-1500	CBN, St. John's, Newfoundland	6160
1400-1500	CBC Northern Quebec Service	9625 11720
1400-1500	M-A CBU, Vancouver, British Columbia	6160
1400-1500	CFCF, Montreal, Quebec	6005
1400-1500	CFCN, Calgary, Alberta	6030
1400-1500	CHNS, Halifax, Nova Scotia	6130
1400-1500	Christian Science World Service	13760 17555 21780
1400-1500	CKWX, Vancouver, British Columbia	6080
1400-1500	CFRB, Toronto, Ontario	6070
1400-1500	S ELWA, Monrovia, Liberia	11830
1400-1500	(US) Far East Network, Tokyo	3910
1400-1500	FEBC, Manila, Philippines	9670 11850
1400-1500	HCJB, Quito, Ecuador	11740 15115 17890
1400-1500	Radio Australia, Melbourne	5995 6035 6060 6080 7205 9580 15140
1400-1500	S Radio Canada Int'l, Montreal	9625 11720 11955 17820

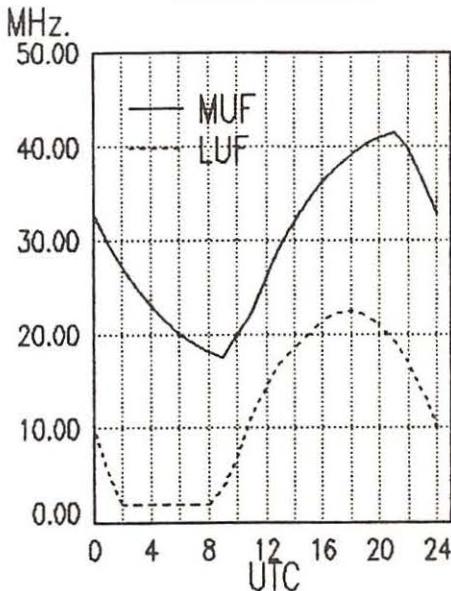
Midwest To
Australia



Midwest To
Central America/Caribbean



Midwest To
South America

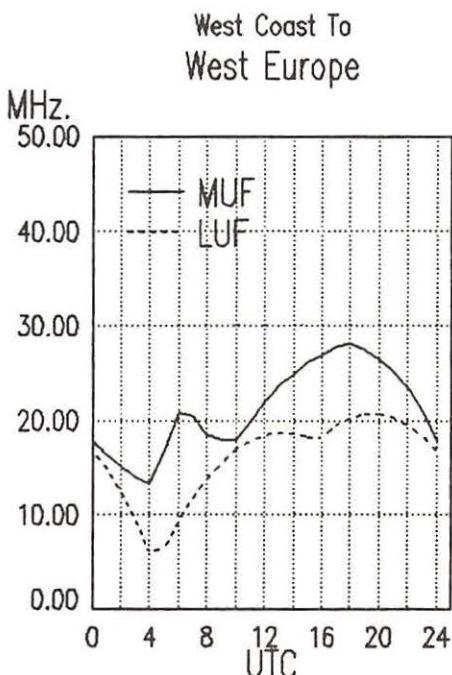
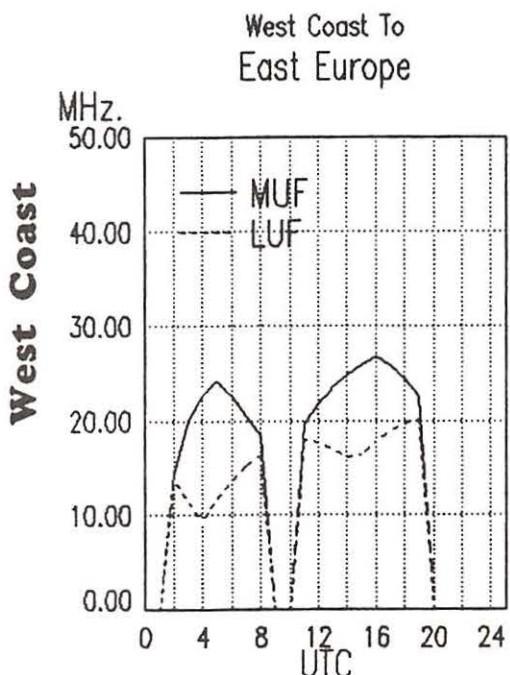
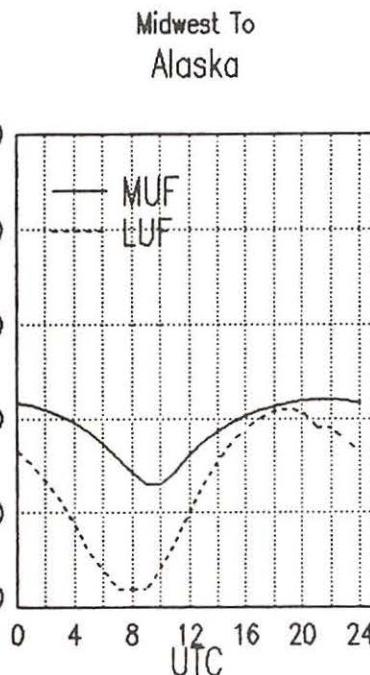


Midwest

frequency

section

1400-1500	Radio Japan, Tokyo	9505 9695 11865 11815	1500-1515	FEBA, Mahe, Seychelles	21470 21710 25750
1400-1500	Radio Korea, Seoul	15410 9750 15575	1500-1520	Radio Ulan Bator, Mongolia	15325 9575 15305
1400-1500	Radio Moscow, USSR	9755 11840 11900 11995	1500-1525	Radio Bucharest, Romania	9510 9690 11775 11940
		12050 13710 15320 15490	1500-1525	Radio Netherland, Hilversum	15250 15335 5955 13770 15150 17605
		15585 17570 17815 21630	1500-1530	Radio Berlin Int'l, East Germany	15240 17880 9560 11735 15310
1400-1500	Radio RSA, South Africa	21725 11925 17745 21590 25790	1500-1530	Radio Sofia, Bulgaria	7165 9770 15220
1400-1500 A,S	Radio Tanzania, Dar es Salaam	7165	1500-1530 A,S	Radio Tanzanla, Dar es Salaam	9735 11965 17810 21600
1400-1500	SBC Radio One, Singapore	5010 5052 11940	1500-1530	Radio Veritas Asia, Philippines	6576 9325 9345 9640
1400-1500 A,S	Superpower KUSW, Utah	9850	1500-1550	Deutsche Welle, West Germany	9977 11740
1400-1500	Voice of America, Washington	6110 9645 9700 9760	1500-1550	Radio Pyongyang, North Korea	7405 11600 11795 15165
		11920 15160 15205 15425	1500-1555	Radio Beijing, China	2310 [ML]
1400-1500	Voice of Kenya, Nairobi	6100	1500-1600	F ABC, Alice Springs, Australia	9610
1400-1500	Voice of Malaysia, Kuala Lumpur	4950	1500-1600	ABC, Perth, Australia	2325 [ML]
1400-1500	Voice of Mediterranean, Malta	11925	1500-1600	F ABC, Tenant Creek, Australia	15460
1400-1500	Voice of Nigeria, Lagos	7255	1500-1600	AWR, Alajuela, Costa Rica	5985
1400-1500	WHRI, Noblesville, Indiana	9465 11790	1500-1600	Burma Broadcasting Service	9625 11720
1400-1500	WYFR, Oakland, California	5950 11830 15215	1500-1600	CBC Northern Quebec Service	6160
1400-1500	WYFR Satellite Net, California	13695	1500-1600	CBN, St. John's, Newfoundland	6160
1415-1420	Radio Nepal, Kathmandu	3230 5005	1500-1600	CBU, Vancouver, British Columbia	6160
1430-1500 F	ABC, Alice Springs, Australia	2310 [ML]	1500-1600	CFCF, Montreal, Quebec	6005
1430-1500 F	ABC, Tenant Creek, Australia	2325 [ML]	1500-1600	CFCN, Calgary, Alberta	6030
1430-1500	Burma Broadcasting Service	5985	1500-1600	CHNS, Halifax, Nova Scotia	6130
1430-1500	King of Hope, Southern Lebanon	6280	1500-1600	Christian Science World Service	13760 17550 21780
1430-1500	KTWR, Agana, Guam	9780	1500-1600	CKWX, Vancouver, British Columbia	6080
1430-1500	Radio Austria Int'l, Vienna	6155 11780 13730 21490	1500-1600	CFRB, Toronto, Ontario	6070
1430-1500	Radio Netherland, Hilversum	5955 13770 15150 17605	1500-1600	S ELWA, Monrovia, Liberia	11830
1430-1500	Radio Prague, Czechoslovakia	9605 11685 13715 15110	1500-1600	(US) Far East Network, Tokyo	3910
		17705 21505	1500-1600	FEBC, Manila, Philippines	11850
1430-1500	Radio Sofia, Bulgaria	7245 9740 11735	1500-1600	HCJB, Quito, Ecuador	11740 15115 17890
1445-1500	Radio Berlin Int'l, East Germany	15240 17880	1500-1600	King of Hope, Southern Lebanon	6280
1445-1500	Radio Canada Int'l, Montreal	11935 15160 15305 15325	1500-1600	KNLS, Anchor Point, Alaska	11650
		17795 17820 21545	1500-1600	KTWR, Agana, Guam	11650
1445-1500 M-A	Radio Ulan Bator, Mongolia	9575 15305	1500-1600	Radio Australia, Melbourne	5995 6035 6060 6080
			1500-1600	Radio Canada Int'l, Montreal	7205 7215 9580 15140
1500-1600	Africa No. 1, Gabon	7200 15200	1500-1600	Radio Japan, Tokyo	9625 11720 11955 17820
1500-1600	Vatican Radio, Vatican City	11955 15090 17870	1500-1600	Radio Jordan, Amman	9505 11865 15140 21700
1500-1600	BBC, London, England	5995 6155 6195 7180	1500-1600	Radio Korea (South), Seoul	9870
		9410 9740 11750 11775	1500-1600	Radio Moscow, USSR	11840 11900 11995 12030
		11940 12095 15070 15260			12050 15135 15490 15585
		15400 17640 17740 17790	1500-1600	Radio RSA, South Africa	17660 17685
					11925 17745 21590 25790



frequency

section

1500-1600	SBC Radio One, Singapore	5010	5052	11940	1600-1625	Radio Budapest, Hungary	6110	9585	9835	11910
1500-1600	SLBC, Sri Lanka	9720			1600-1625	Radio Prague, Czechoslovakia	15160			
1500-1600	Superpower KUSW, Utah	9850					6055	9605	11665	11685
1500-1600	Voice of America, Washington	6110	9575	9645	9700		11990	13715	15110	15155
		9760	15205	15260			17705	21505		
1500-1600	Voice of Ethiopia, Addis Ababa	7165	9560		1600-1630	ELWA, Monrovia, Liberia	11830			
1500-1600	Voice of Indonesia, Jakarta	11790	15150		1600-1630	HCJB, Quito, Ecuador	15115	17890		
1500-1600	Voice of Kenya, Nairobi	6100			1600-1630	Radio Berlin Int'l, East Germany	7295	9730	15355	17780
1500-1600	Voice of Malaysia, Kuala Lumpur	4950			1600-1630	S Radio Norway Int'l, Oslo	15310	21705	25730	
1500-1600	Voice of Mediterranean, Malta	11925			1600-1630	Radio Pakistan, Islamabad	7365	9465	9785	11615
1500-1600	Voice of Nigeria, Lagos	7255	11770		1600-1630	Radio Polonia, Warsaw, Poland	11625	15125		
1500-1600	WHRI, Noblesville, Indiana	15105	21840		1600-1630	Radio Portugal, Lisbon	6135	9540		
1500-1600	WRNO, New Orleans, Louisiana	11965			1600-1630	SLBC, Colombo, Sri Lanka	15120			
1500-1600	WYFR, Oakland, California	5950	11580		1600-1630	Trans World Radio, Swaziland	6075	9720		
1500-1600	WYFR Satellite Net	11830	13695	15215	1600-1630	Voice of Asia, Taiwan	5055	9525		
1515-1530 M-H	Radio Budapest, Hungary	7220	9585	9835	1600-1630	Voice of Vietnam, Hanoi	5980	7445		
		15160	15220		1600-1645	Radio Nacional Angola, Luanda	12020	15010		
1515-1600	FEBA, Mahe, Seychelles	11865	15325		1600-1645	UAE Radio, United Arab Emirates	7245	9535	11955	
1515-1600	Radio Berlin Int'l, East Germany	6115	7295	9730	1600-1645	Deutche Welle, West Germany	11730	15435	17865	
1530-1545	All India Radio, New Delhi	3905	3925	4860	1600-1650		6170	7200	9745	15105
		7160	7412	9545	1600-1650		15595	17825	21680	
1530-1555	BRT, Brussels, Belgium	17595	21810		1600-1655	Radio Beijing, China	9570	11600	11715	15110
1530-1600	Radio Prague, Czechoslovakia	6055	7395	9605	1600-1700 F	ABC, Alice Springs, Australia	2310	[ML]		
		11990	13715	15110	1600-1700	ABC, Perth, Australia	9610			
		17705	21505		1600-1700 F	ABC, Tennant Creek, Australia	2325	[ML]		
1530-1600	Radio Sweden, Stockholm	17705	17880	21610	1600-1700	AWR, Alajuela, Costa Rica	15460			
1530-1600	Radio Tanzania, Dar es Salaam	9684			1600-1700	BBC, London, England	5975	5995	6195	7180
1530-1600	Radio Tirana, Albania	9480	11835		1600-1700	CBC Northern Quebec Service	9740	9410	11640	11750
1530-1600	Radio-Television Morocco, Rabat	17595			1600-1700	CBN, St. John's, Newfoundland	11775	11940	12095	15070
1530-1600	Swiss Radio Int'l, Berne	13635	13685	17830	1600-1700	CBU, Vancouver, British Columbia	15260	15400	17640	17705
1530-1600	Voice of Asia, Taiwan	5980	7445		1600-1700	CFCF, Montreal, Quebec	17880	21470	21710	25750
1530-1600	Voice of Nigeria, Lagos	15120			1600-1700	CFCN, Calgary, Alberta	9625	11720		
1540-1550 M-A	Voice of Greece, Athens	7295	17550		1600-1700	CHNS, Halifax, Nova Scotia	6160			
1545-1600	Radio Berlin Int'l, East Germany	7295	9730	15340	1600-1700	Christian Science World Service	6160			
1545-1600	Vatican Radio, Vatican City	11810	15120	17730	1600-1700	CKWX, Vancouver, British Columbia	21640			
1545-1600	Voice of Vietnam, Hanoi	10011	11750		1600-1700	CFRB, Toronto, Ontario	6080			
1550-1600 H-S	KTWR, Agana, Guam	9780			1600-1700	(US) Far East Network, Tokyo	6070			
					1600-1700	KNLS, Anchor Point, Alaska	3910			
					1600-1700	KSDA, Guam	12020			
					1600-1700	KTWR, Guam	11980			
					1600-1700		11650			

1600 UTC [12:00 PM EDT/9:00 AM PDT]

1600-1605	SBC Radio One, Singapore	5010	5052	11940
1600-1610	FEBA, Mahe, Seychelles	11865	15325	
1600-1610	Radio Lesotho, Maseru	4800		

West Coast To

Arctic Europe

MHz.

50.00

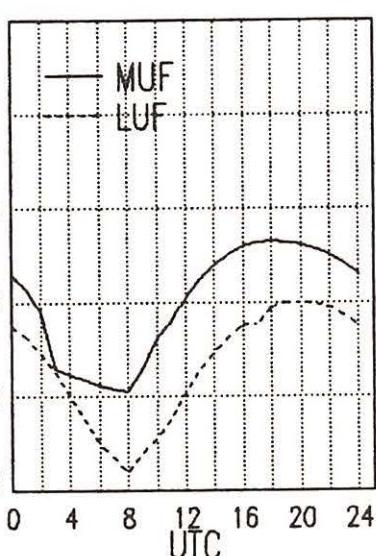
40.00

30.00

20.00

10.00

0.00



West Coast To
East Africa

MHz.

50.00

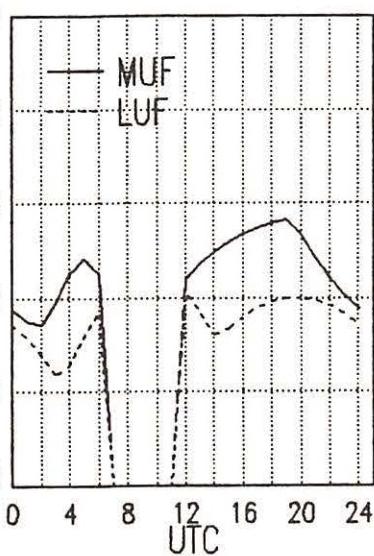
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MHz.

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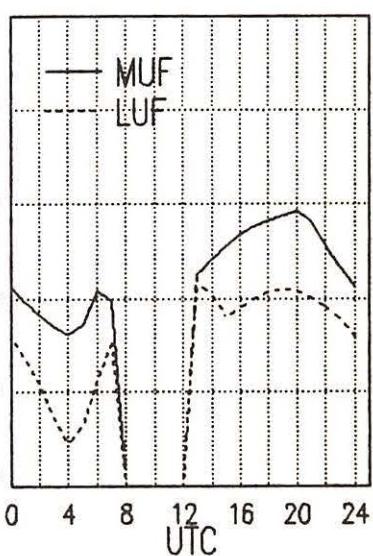
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frequency

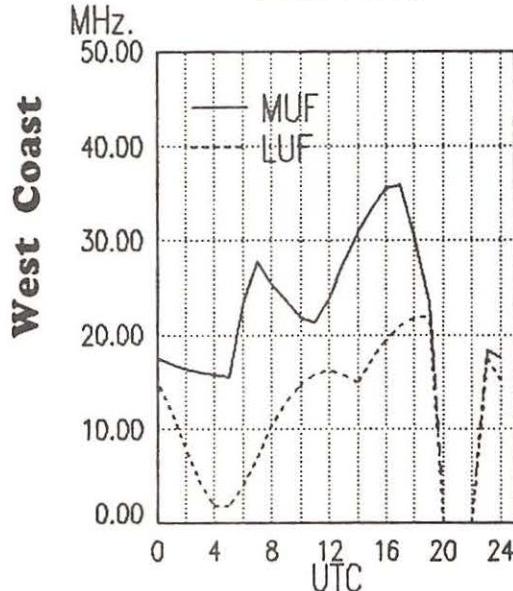
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1600-1700	Radio Australia, Melbourne	5995 6035 6060 6080	1700-1745	BBC, London, England	9410 9740 11750 11775
		7205 7215 9580			11940 12095 15070 15260
1600-1700	Radio Beijing, China	15130			15310 15400 17640 17695
1600-1700	Radio France Int'l, Paris	6175 11705 15360 17620			17880 21470 25750
		17795	1700-1750	Radio Pyongyang, North Korea	7290 9345 9640 9977
1600-1700	Radio Jordan, Amman	9560			11760
1600-1700	Radio Korea, Seoul, South Korea	5985 9870	1700-1755	Radio Beijing, China	9570 9750 11600
1600-1700	Radio Malawi, Blantyre	3380 5995	1700-1800	F ABC, Alice Springs, Australia	2310 [ML]
1600-1700	Radio Moscow, USSR	11840 11900 11995 12030		ABC, Tennant Creek, Australia	2325 [ML]
		12050 15135 15585 17685	1700-1800	AWR Africa, Gabon	9625
1600-1700	Radio Riyadh, Saudi Arabia	9705 9720		CBC Northern Quebec Service	9625 11720
1600-1700	Radio Tanzania, Dar es Salaam	9684	1700-1800	CBN, St. John's, Newfoundland	6160
1600-1700	Superpower KUSW, Utah	15650		CBU, Vancouver, British Columbia	6160
1600-1700	Voice of America, Washington, DC	9575 9645 9760 11920	1700-1800	CFCF, Montreal, Quebec	6005
		15410 15445 15580 15600		CFCN, Calgary, Alberta	6030
		17785 17800 17870	1700-1800	CHNS, Halifax, Nova Scotia	6130
1600-1700	WHRI, Noblesville, Indiana	11790 21840		Christian Science World Service	21640
1600-1700	WINB, Red Lion, Pennsylvania	15295	1700-1800	CKWX, Vancouver, British Columbia	6080
1600-1700	WRNO, New Orleans, Louisiana	11965		CFRB, Toronto, Ontario	6070
1600-1700	WYFR, Oakland, California	11580 15215 17845 21615	1700-1800	(US) Far East Network, Tokyo	3910
1600-1700	WYFR Satellite Network	13695 15170 15345		Radio Havana Cuba	11920
1600-1700	Radio Zambia, Lusaka	9580	1700-1800	Radio Jordan, Amman	9560
1605-1700 F,A	SBC Radio One, Singapore	5052 11940		Radio Korea, Seoul, South Korea	5975 9870 15575
1615-1630	Voice of Vietnam, Hanoi	10011 11750	1700-1800	M-F Radio Malabo, Equatorial Guinea	9553 [ML]
1630-1700 A	Radio Austria Int'l, Vienna	6155 11780 13730 21490		Radio Moscow, USSR	9540 9755 9795 9825
1630-1700	Radio Netherlands, Hilversum	6020 15570	1700-1800		9895 11730 11840 11990
1630-1700	Radio Peace & Progress, USSR	6110 6135 9830 11670			12050 15135 17570
		11695 11910 11775 12055	1700-1800	Radio for Peace, Costa Rica	25945
		17595 17615	1700-1800	Radio Riyadh, Saudi Arabia	9705 9720
1630-1700	RTM Morocco	17595 17815		Radio Tanzania, Dar es Salaam	9684
1645-1700	Radio Korea (South), Seoul	5975 7275 9870	1700-1800	Radio Zambia, Lusaka	9580
			1700-1800	RTM Morocco	17815
				SBC Radio One, Singapore	5052 11940
			1700-1800	Superpower KUSW, Utah	15650
				A,S Swaziland Commercial Radio	6155
			1700-1800	Voice of Africa, Egypt	15255
				Voice of America, Washington	6110 9575 9645 9760
			1700-1800		11760 11920 15205 15410
					15445 15580 15600 17785
			1700-1800		17800 17870
					6100
			1700-1800	Voice of Kenya, Nairobi	11770
				Voice of Nigeria, Lagos	11770
			1700-1800	WHRI, Noblesville, Indiana	13760 15105
				WINB, Red Lion, Pennsylvania	15295
			1700-1800 S-F	WMLK, Bethel, Pennsylvania	9465

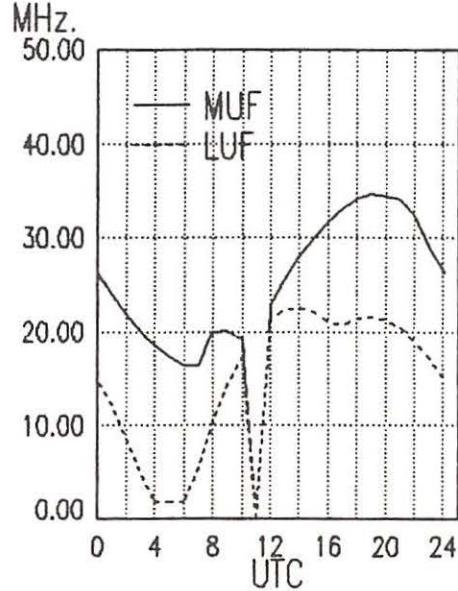
1700 UTC [1:00 PM EDT/10:00 AM PDT]

1700-1705	Radio Uganda, Kampala	4976 5026	1700-1800	Radio for Peace, Costa Rica	25945
1700-1715	Kol Israel, Jerusalem	9385 11585 13750	1700-1800	Radio Riyadh, Saudi Arabia	9705 9720
1700-1715 M-A	Voice of Namibia (Angola)	11955		Radio Tanzania, Dar es Salaam	9684
1700-1725	Radio Netherland, Hilversum	6020 15570	1700-1800	Radio Zambia, Lusaka	9580
1700-1730	Radio Australia, Melbourne	5995 6060 6080 7205	1700-1800	RTM Morocco	17815
		9580 15140		SBC Radio One, Singapore	5052 11940
1700-1730	Radio Japan, Tokyo	9695 9535 11865	1700-1800	Superpower KUSW, Utah	15650
1700-1730 S	Radio Norway Int'l, Oslo	17780 25730		A,S Swaziland Commercial Radio	6155
1700-1730	Radio Sweden Int'l, Stockholm	6065 9655	1700-1800	Voice of Africa, Egypt	15255
1700-1730	SLBC, Colombo, Sri Lanka	11800		Voice of America, Washington	6110 9575 9645 9760
			1700-1800		11760 11920 15205 15410
					15445 15580 15600 17785
			1700-1800		17800 17870
					6100
			1700-1800	Voice of Kenya, Nairobi	11770
				Voice of Nigeria, Lagos	11770
			1700-1800	WHRI, Noblesville, Indiana	13760 15105
				WINB, Red Lion, Pennsylvania	15295
			1700-1800 S-F	WMLK, Bethel, Pennsylvania	9465

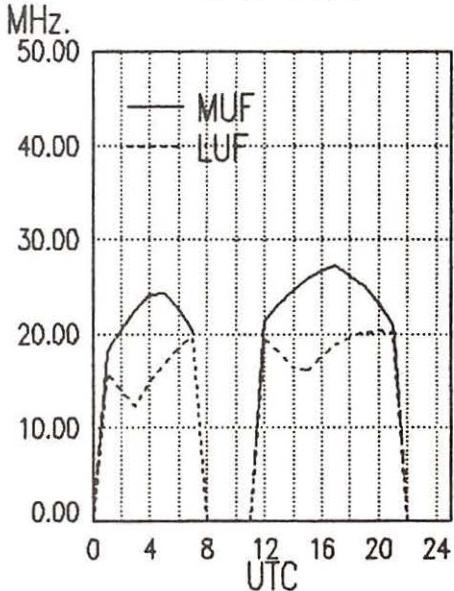
West Coast To
South Africa



West Coast To
West Africa



West Coast To
Middle East

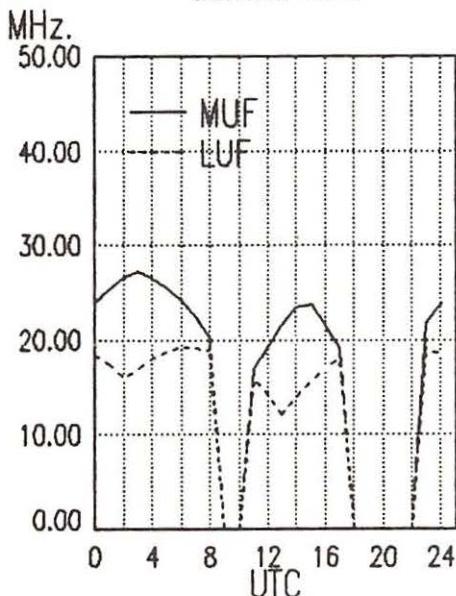


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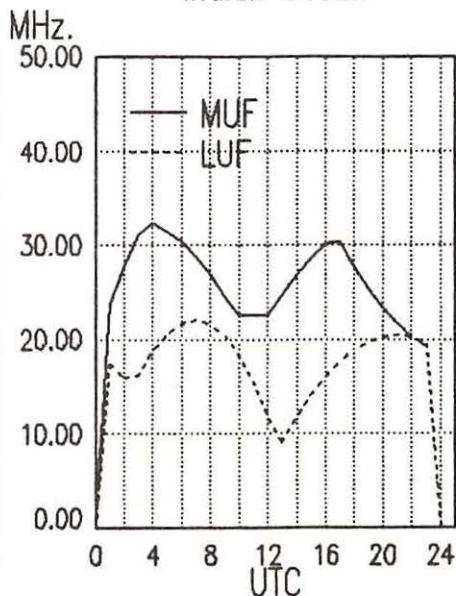
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1700-1800	WRNO, Louisiana	15420	1800-1830	Voice of Africa, Egypt	15255
1700-1800	WYFR Satellite Net	11830 13695 15215	1800-1830	Voice of Vietnam, Hanoi	12020 21590
1700-1800	WYFR, Okeechobee, Florida	11380 15345	1800-1845	Radio Abidjan, Ivory Coast	11920
1715-1730 M-F	Radio Canada Int'l, Montreal	5995 7235 15325 17820	1800-1845	Trans World Radio, Swaziland	9525
1715-1745	BBC, London, England*	3975 6185 7165	1800-1850	Radio Bras, Brasilia, Brazil	15265
1718-1800	Radio Pakistan, Islamabad	6210	1800-1856	Radio RSA, South Africa	15365 17795 21535
1725-1740	Radio Suriname Int'l, Paramaribo	17835v	1800-1900 F	ABC, Alice Springs, Australia	2310 [ML]
1725-1800	Radio New Zealand, Wellington	11780 15150	1800-1900 F	ABC, Tennant Creek, Australia	2325 [ML]
1730-1735	All India Radio, New Delhi	4840 4860 4920 6160	1800-1900	All India Radio, New Delhi	11935 15360
		7412 9950	1800-1900	CBC Northern Quebec Service	9625 11720
1730-1755	BRT, Brussels, Belgium	5915 11695	1800-1900	CBN, St. John's, Newfoundland	6160
1730-1755	Radio Austria Int'l, Vienna	5945 6155 12010 13730	1800-1900	CBU, Vancouver, British Columbia	6160
1730-1755	Radio Bucharest, Romania	7105 9530 9685 11790	1800-1900	CFCF, Montreal, Quebec	6005
1730-1800	Radio Australia, Melbourne	11940 15270 15340 17745	1800-1900	CFCN, Calgary, Alberta	6030
		5995 6035 6060 6080	1800-1900	CHNS, Halifax, Nova Scotia	6130
		7205 9580	1800-1900	Christian Science World Service	21640
1730-1800	Radio Berlin Int'l, East Germany	9665 13610 15145 15255	1800-1900	CKWX, Vancouver, British Columbia	6080
1730-1800	Radio Polonia, Warsaw, Poland	6135 9540	1800-1900	CFRB, Toronto, Ontario	6070
1730-1800	Radio Prague, Czechoslovakia	9605 11685 11990 13715	1800-1900	(US) Far East Network, Tokyo	3910
		15110 21505	1800-1900	KNLS, Anchor Point, Alaska	7355
1730-1800	RAE, Buenos Aires, Argentina	15345	1800-1900	KYOI, Salpan	9455
1730-1800	Swiss Radio Int'l, Berne	3985 6165 9535	1800-1900	Radio Australia, Melbourne	5995 6035 6060 6080
1734-1800	FEBA, Mahe, Seychelles	11810			7205 7215 9580
1745-1800	BBC, London, England	9410 9740 11750 12095	1800-1900 A,S	Radio Canada Int'l, Montreal	15260 17820
		15070 15400 17640 17880	1800-1900	Radio Jamahiriya, Libya	15450
		17885 21470	1800-1900	Radio Jordan, Amman	9560
			1800-1900	Radio Kuwait, Kuwait	11665
			1800-1900	Radio Malabo, Equatorial Guinea	9553v [ML]
			1800-1900	Radio Moscow, USSR	9755 9825 9895 11730
					11840 11990 12050 15405
					15425 15475 17570
					11780 15150
					9705 9720
1800-1805 A	SBC Radio One, Singapore	11940	1800-1900	Radio New Zealand, Wellington	9684
1800-1815	Radio Cameroon, Yaounde	3970 4750 4795 4850	1800-1900	Radio Riyadh, Saudi Arabia	9580
		5010	1800-1900	Radio Tanzania, Dar es Salaam	15650
1800-1815	SLBC, Colombo, Sri Lanka	11800	1800-1900	Radio Zambia, Lusaka	6155
1800-1825 A,S	FEBA, Mahe, Seychelles	11760	1800-1900	Superpower KUSW, Utah	9575 9760 11760 11800
1800-1825	Radio Prague, Czechoslovakia	5930 7345 9605 11685	1800-1900 A,S	Swaziland Commercial Radio	15205 15410 15445 15580
		11990 13715 15110 21505	1800-1900	Voice of America, Washington	15600 17785 17800 17870
1800-1825	RAE, Buenos Aires, Argentina	15345			21485
1800-1830	BBC, London, England	7325 9410 9740 12095	1800-1900	Voice of Ethiopia	9662
		15070 15400 15420 17640	1800-1900	Voice of Kenya, Nairobi	6100
		17695 17880 17885	1800-1900	Voice of Nigeria, Lagos	11770 15120
1800-1830 S	Radio Bamako, Mali	4835 5995	1800-1900	WHRI, Noblesville, Indiana	13760 17830
1800-1830 M-F	Radio Canada Int'l, Montreal	15260 17820			
1800-1830	Radio Mozambique, Maputo	3265 4855 9618			
1800-1830	Radio Sweden, Stockholm	6065 11845			

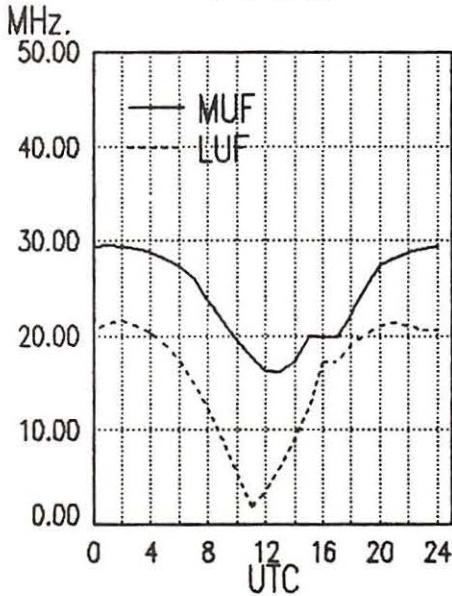
West Coast To
Central Asia



West Coast To
Indian Ocean



West Coast To
Far East



West Coast

frequency

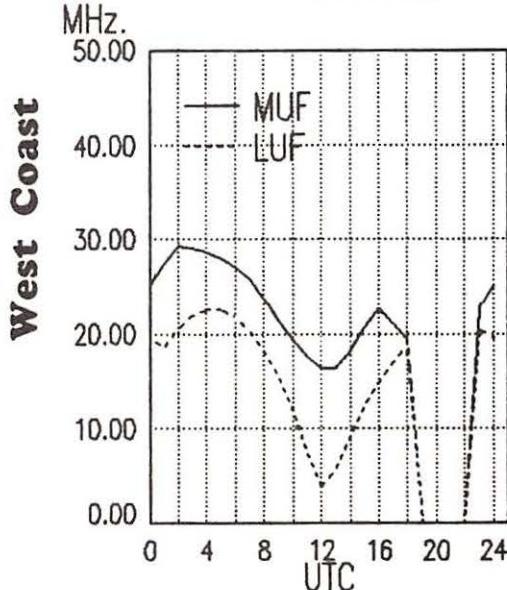
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1800-1900	WINB, Red Lion, Pennsylvania	15295	1900-2000	All India Radio, New Delhi	7412 11620 11935 15360
1800-1900 S-F	WMLK, Bethel, Pennsylvania	9465	1900-2000	BBC, London, England	9410 9740 12095 15070
1800-1900	WRNO, New Orleans, Louisiana	15420		CBC Northern Quebec Service	15400 17695 17880
1800-1900	WYFR, Oakland, California	11580 15215 15345	1900-2000	CBN, St. John's, Newfoundland	9625 11720
1800-1900	WYFR Satellite Net, California	11830 13695	1900-2000	CBU, Vancouver, British Columbia	6160
1815-1900	Radio Bangladesh, Dhaka	6240 7505 11510 15510	1900-2000	CFCF, Montreal, Quebec	6160
1830-1855	Radio Austria Int'l, Vienna	5945 6155 12010 13730	1900-2000	CFCN, Calgary, Alberta	6005
1800-1855	Radio Polonia, Warsaw, Poland	5995 6135 7125 7285	1900-2000	CHNS, Halifax, Nova Scotia	6030
		9525 11840	1900-2000	Christian Science World Service	6130
1830-1855	BRT Brussels, Belgium	5915 11695	1900-2000	CKWX, Vancouver, British Columbia	21640
1830-1900	BBC, London, England	7325 9410 9740 11750	1900-2000	CFRB, Toronto, Ontario	6080
		12095 15070 15400 17885	1900-2000	(US) Far East Network, Tokyo	6070
1830-1900	Radio Berlin Int'l, E. Germany	9665 13610 15145 15255	1900-2000	HCJB, Quito, Ecuador	3910
1830-1900 M-F	Radio Canada Int'l, Montreal	9555 15325 17875 21675	1900-2000	KYOL, Salpan	15270 17790 21470
1830-1900	Radio Korea, Seoul, South Korea	9870 15575	1900-2000	Radio Algiers, Algeria	9455
1830-1900 MWF	Radio Mozambique, Maputo	3265 4855 9618	1900-2000	Radio Australia, Melbourne	9509 9685 15215 17745
1830-1900	Radio Netherland, Hilversum	6020 15560 17605 21685	1900-2000	Radio Ghana, Accra	6035 6060 6080 7205
1830-1900	Radio Sofia, Bulgaria	7245 9560 11735 15310	1900-2000	Radio Havana Cuba	7215 9580 15140
1830-1900	Swiss Radio International, Berne	9885 11955	1900-2000	Radio Jordan, Amman	6130
1840-1855 M-A	Voice of Greece, Athens	11645 12045 15630	1900-2000	Radio Kuwait, Kuwait	11950
1840-1900	Radio Senegal, Dakar	4950	1900-2000	Radio Malabo, Equatorial Guinea	9560
1845-1855	Radio Nacional, Conakry, Guinea	4833 4900 7125	1900-2000	Radio Moscow, USSR	9870 15575
1845-1900	All India Radio, New Delhi	7412 11620	1900-2000	M-A	9553 [ML]

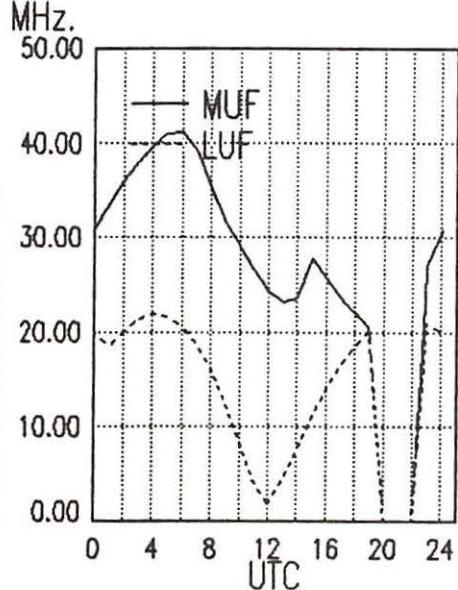
1900 UTC [3:00 PM EDT/12:00 PM PDT]

1900-1903	Africa No. 1, Gabon	15475	1900-2000	Radio Moscow British Service	11840 11990 12010 12050
1900-1905 M-A	Vatican Radio, Vatican City	6190 6248 7250 9645	1900-2000	Radio New Zealand, Wellington	15295 15405 15425 17570
1900-1915	Radio Bangladesh, Dhaka	6240 7505 11510	1900-2000	Radio Prague, Czechoslovakia	7240 7350 9450 9695
1900-1915	Radio Tanzania, Dar es Salaam	9684	1900-2000	Radio Riyadh, Saudi Arabia	11780 15150
1900-1925	Radio Netherland, Hilversum	6020 15560 17605 21685	1900-2000	Radio RSA, South Africa	5930 7345
1900-1925	Voice of Islamic Republic Iran	9695	1900-2000	Radio Zambia, Lusaka	9705 9720
1900-1930 F	ABC, Alice Springs, Australia	2310 [ML]	1900-2000	Spanish Foreign Radio, Madrid	7270 11900 15365
1900-1930 F	ABC, Tennant Creek, Australia	2325 [ML]	1900-2000	Superpower KUSW, Utah	11790 15375 15395
1900-1930	Koi Israel, Jerusalem	12077 15095 15640	1900-2000 A,S	Swaziland Commercial Radio	15650
1900-1930	Radio Afghanistan, Kabul	7160 7310 9640	1900-2000	Trans World Radio Swaziland	6155
1900-1930	Radio Berlin Int'l, East Germany	9665 11920 15255	1900-2000	Voice of America, Washington	3205
1900-1930	Radio Japan, Tokyo	9505 11705		9700 9760 11760 15205	
1900-1930 S	Radio Norway Int'l, Oslo	9590 15220 21705	1900-2000	Voice of Ethiopia, Addis Ababa	15410 15445 15580 15600
1900-1930 M-F	Radio Portugal, Lisbon	11740 11870 15250	1900-2000	Voice of Kenya, Nairobi	17740 17785 17800 17870
1900-1930	Radio Sofia, Bulgaria	7245 9560 11735 15310	1900-2000	Voice of Nigeria, Lagos	9595
1900-1930	Voice of Vietnam, Hanoi	9840 12020 15010	1900-2000	WHRI, Noblesville, Indiana	6100
1900-1950	Deutsche Welle, Köln, W. Germany	9745 11810 13790 15390	1900-2000	WINB, Red Lion, Pennsylvania	7255 11770
1900-1955	Radio Beijing, China	6860 9470	1900-2000 S-F	13760 17830	
				WMLK, Bethel, Pennsylvania	15295
					9465

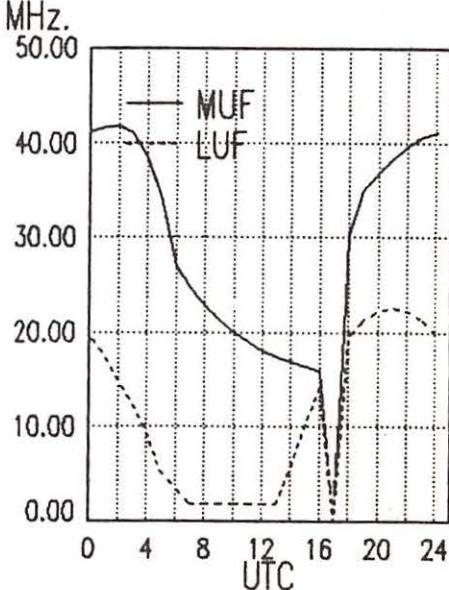
West Coast To
South East Asia



West Coast To
Indonesia



West Coast To
Pacific

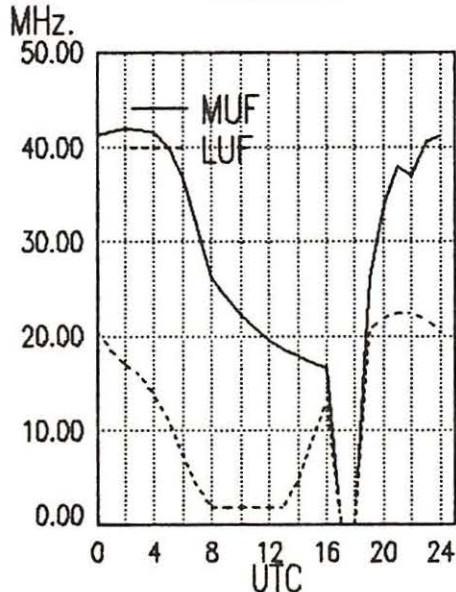


frequency

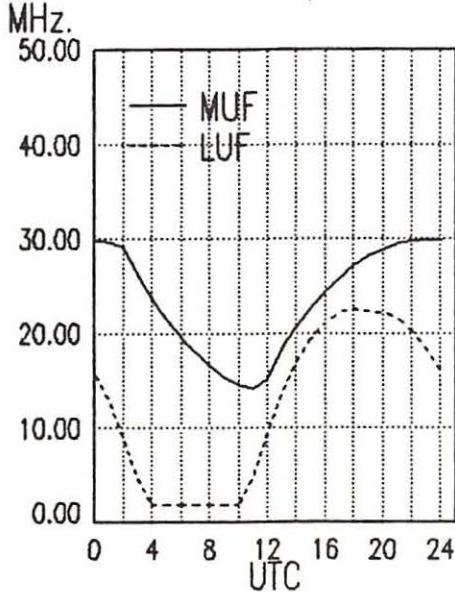
section

1900-2000	WRNO, New Orleans, Louisiana	15420	2000-2100	M-A ABC, Alice Springs, Australia	2310 [ML]
1900-2000	WYFR, Oakland, California	15215 15345 15566	2000-2100	ABC, Katherine, Australia	2485
1900-2000	WYFR Satellite Net, California	11830 13695	2000-2100	M-A ABC, Tennant Creek, Australia	2325 [ML]
1910-1920	Radio Botswana, Gaborone	3356 4820	2000-2030	BBC, London, England	11820 12095 15070 15260
1915-2000	Radio Berlin Int'l, East Germany	9665 13610 15255			15400 17690 17760 17755
1920-1930	M-A Voice of Greece, Athens	7430 9395 9425			17880
1930-1940	Radio Togo, Lome	5047	2000-2050	Deutsche Welle, West Germany	15435
1930-2000	ABC, Katherine, Australia	2485	2000-2100	CBC Northern Quebec Service	9625 11720
1930-2000	Radio Beijing, China	6955 7480 9440	2000-2100	CBN, St. John's, Newfoundland	6160
1930-2000	Radio Bucharest, Romania	7145 9690 9750 11940	2000-2100	CBU, Vancouver, British Columbia	6160
1930-2000	Voice of Republic of Iran	6080 9022	2000-2100	CFCF, Montreal, Quebec	6005
1930-2000	WINB, Red Lion, Pennsylvania	15185	2000-2100	CFCN, Calgary, Alberta	6030
1935-1955	RAI, Rome, Italy	7275 7290 9575	2000-2100	CHNS, Halifax, Nova Scotia	6130
1940-2000	M-A Radio Ulan Bator, Mongolia	9575 11870	2000-2100	Christian Science World Service	15390 17555 21640
1945-2000	All India Radio, New Delhi	9755 11860	2000-2100	CKWX, Vancouver, British Columbia	6080
1950-2000	Vatican Radio, Vatican City	6190 7250 9645	2000-2100	CFRB, Toronto, Ontario	6070
			2000-2100	(US) Far East Network, Tokyo	3910
			2000-2100	King of Hope, Southern Lebanon	6280
			2000-2100	KVOH, Rancho Simi, California	17775
			2000-2100	Radio Baghdad, Iraq	7280
			2000-2100	Radio Havana Cuba	11950
			2000-2100	Radio Jordan, Amman	9560
			2000-2100	Radio Kuwait, Kuwait	11665
			2000-2100	Radio Malabo, Equatorial Guinea	9553v
			2000-2100	Radio Moscow, USSR	11675 11730 11820 11840
				12030 12050 13605 15295	
				15535 21630	
2000-2005	Radio Zambia, Lusaka	3345 6165	2000-2100	Radio New Zealand, Wellington	12050 15150
2000-2010	A Radio Zambia, Lusaka	3345 6165	2000-2100	A,S Radio for Peace, Costa Rica	21565 25945
2000-2010	Voice of Kenya, Nairobi	6100	2000-2100	Radio Riyadh, Saudi Arabia	9705 9720
2000-2015	Radio Togo, Lome	3220 5047	2000-2100	Radio Tonga, Tonga	5050
2000-2015	M-A Radio Ulan Bator, Mongolia	9575 11870	2000-2100	Radio Zambia, Lusaka	9580
2000-2015	Trans World Radio, Swaziland	3205	2000-2100	Superpower KUSW, Utah	15650
2000-2025	Radio Beijing, China	6955 7480 9440 9745	2000-2100	Voice of America, Washington	9700 9760 11760 15205
2000-2025	Radio Bucharest, Romania	11715	2000-2100	15410 15445 15580 15600	
2000-2025	5990 6105 7145 7195		2000-2100	17785 17800 17870	
2000-2030	9570 9690 11940		2000-2100	11770	
2000-2030	Radio Australia, Melbourne	6035 7205 7215 9580	2000-2100	13760 17830	
2000-2030	6920		2000-2100	15185	
2000-2030	Radio Berlin Int'l, East Germany	6115	2000-2100	9465	
2000-2030	Radio Budapest, Hungary	6110 7220 9585 9835	2000-2100	15420	
2000-2030	11910 15160		2000-2100	11580 15566 17845 21525	
2000-2030	Radio Ghana, Nairobi	3366 4915	2000-2100	21615	
2000-2030	Radio Norway International, Oslo	15310 17780	2000-2100	13695 15170	
2000-2030	Radio Polonia, Warsaw, Poland	7125 7145 9525	2000-2100	15095 17710 17910	
2000-2030	Swaziland Commercial Radio	6155	S-F		
2000-2030	Voice of Nigeria, Lagos	7255			
2000-2030	Voice of Republic of Iran	6080 9022			
2000-2045	All India Radio, New Delhi	7412 9755 9910 11620			
2000-2050	11860				
2000-2050	Radio Pyongyang, North Korea	6576 9345 9640 9977	2000-2100	M-A WYFR Satellite Net, California	
2000-2050	Voice of Turkey, Ankara	9825	2005-2100	Radio Damascus, Syria	

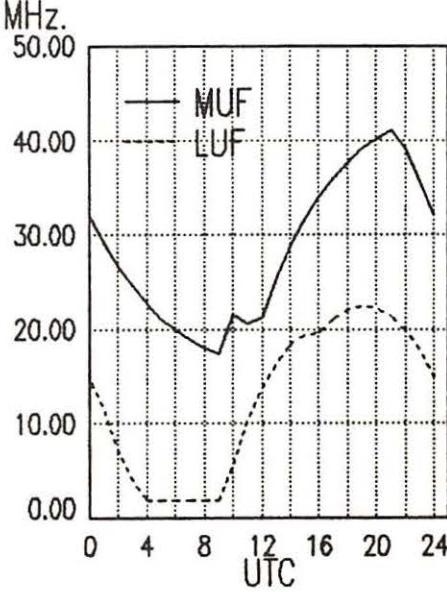
West Coast To
Australia



West Coast To
Central America/Caribbean



West Coast To
South America



West Coast

frequency

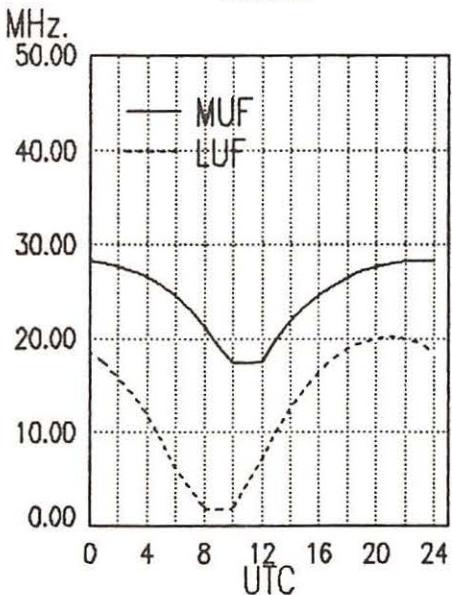
Section

2010-2100	A,S	Voice of Kenya, Nairobi	6100		2100-2130	Swiss Radio Int'l, Berne	9885	13635	15570
2015-2100		ELWA, Monrovia, Liberia	11830		2100-2135	ELWA, Monrovia, Liberia	11830		
2025-2045		RAI, Rome, Italy	6165	9575	2100-2145	Radio Berlin Int'l, East Germany	9730		
2030-2055		Radio Polonia, Warsaw, Poland	6095	7285	2100-2145	Radio Yugoslavia, Belgrade	7215	9620	11735 15105
2030-2100		BBC, London, England	5975	7325 9410 11750	2100-2150	Radio Baghdad, Iraq	13660		
			11920	12095 15070 15140	2100-2200	WYFR, Oakland, California	11580	13695	15170 15215
			15260	15400 17695 17755			15430	15566	17845 21252
			17760					21615	
2030-2100		Radio Australia, Melbourne	9580	9620	2100-2150	Deutsche Welle, West Germany	7130	9765	13780
2030-2100		Radio Beijing, China	6955	7480 9440 9745	2100-2155	Radio Beijing, China	6860	9470	9860
			11790		2100-2200	M-A ABC, Alice Springs, Australia	2310	[ML]	
2030-2100		Radio Korea, Seoul, South Korea	6480	7550 15575	2100-2200	ABC, Katherine, Australia	2485		
2030-2100		Radio Netherland, Hilversum	9860	13700 15560	2100-2200	M-A ABC, Tennant Creek, Australia	2325	[ML]	
2030-2100		Radio Sofia, Bulgaria	7115	7155 9700 11720	2100-2200	All India Radio, New Delhi	7412	9910	11620 11715
			15290	15330	2100-2200	BBC, London, England	3995	5975	6005 6175
2030-2100	M	Radio Tallin, Estonian SSR	5925				6180	7325	9410 11750
2030-2100		Radio Tirana, Albania	9480	11835			12095	15070	15140 15260
2030-2100		Voice of Africa, Cairo, Egypt	15375				15400	17755	17760 17880
2030-2100		Voice of Vietnam, Hanoi	9840	12020 15010	2100-2200	CBC Northern Quebec Service	9625	11720	
2045-2100		All India Radio, New Delhi	7412	9550 9910 11620	2100-2200	CBN, St. John's, Newfoundland	6160		
			11715		2100-2200	CBU, Vancouver, British Columbia	6160		
2045-2100		IBRA Radio, Malta	7110		2100-2200	CFCF, Montreal, Quebec	6005		
2045-2100		Vatican Radio, Vatican City	9625	11700 11695 15120	2100-2200	CFCN, Calgary, Alberta	6030		

2100 UTC [5:00 PM EDT/2:00 PM PDT]

2100-2105	Radio Damascus, Syria	15095	17710	17910	2100-2200	CFB, Toronto, Ontario	5570
2100-2105	Radio Zambia, Lusaka	3345	6165		2100-2200	(US) Far East Network, Tokyo	3910
2100-2110	Vatican Radio, Vatican City	6190	7250	9645	2100-2200	King of Hope, Southern Lebanon	6280
2100-2110 A,S	Voice of Kenya, Nairobi	6100			2100-2200	KSDA, Agat, Guam	7365 15125
2100-2115	IBRA Radio, Malta	7110			2100-2200	KVOH, Rancho Simi, California	17775
2100-2125	BRT, Brussels, Belgium	5915	9925		2100-2200	Radio Australia, Melbourne	15160 15240 15395 17795
2100-2125	Radio Beijing, China	6955	7480	9440	2100-2200 A,S	Radio Canada Int'l, Montreal	13660 15325 17875
		11790			2100-2200	Radio Jordan, Amman	9560
2100-2125	Radio Bucharest, Romania	5990	6105	7145	2100-2200	Radio Moscow, USSR	9765 11675 11730 11820
		9690	11940				11940 11980 12055 13605
							15295 15535 15560
2100-2125	Radio Finland, Helsinki	6120	9670	11755	2100-2200 A,S	Radio Malabo, Equatorial Guinea	9552.5
2100-2125	Radio Netherland, Hilversum	9860	13700	15560	2100-2200	Radio Tonga, Tonga	5050
2100-2130 S	Radio Austria Int'l, Vienna	5945	6155	9585	2100-2200	Radio for Peace, Costa Rica	21565 25945
2100-2130	Radio Japan, Tokyo	11845	11945	15230	2100-2200 A,S	Radio Zambia, Lusaka	9580
		17890			2100-2200	Spanish Foreign Radio, Madrid	11790 15280
2100-2130	Radio Korea, Seoul, South Korea	6480	7550	15575	2100-2200 M-A	Superpower KUSW, Utah	15650
2100-2130	Radio Peace & Progress, USSR	7340	7420	9550	2100-2200	Voice of Africa, Cairo, Egypt	15280
		11980	15240		2100-2200	Voice of America, Washington	9700 9760 11760 15205
2100-2130	Radio Sweden, Stockholm	6065	9655				15410 15445 15580 15600

West Coast To Alaska



DID WE MISS SOMETHING?

Let us know your corrections and additions by sending them to frequency manager Greg Jordan at 1855-1 Franciscan Terrace, Winston-Salem, NC 27127.

Send your special QSLs or good photocopies to share with other monitors as we have space. We'll copy and return them to you within the month. Send to QSL, P.O. Box 98, Brasstown, NC 28902.



Radio
Berlin
International
DDR 1160 BERLIN

from Bill Romberg, Milwaukee, WI

frequency

section

2100-2200	Voice of Nigeria, Lagos	17785 17800 17870
2100-2200	WHRI, Noblesville, Indiana	15120
2100-2200	WRNO, New Orleans, Louisiana	13760 17830
2103-2200	WINB, Red Lion, Pennsylvania	13720
2103-2200	WINB, Red Lion, Pennsylvania	15185
2110-2200	Radio Damascus, Syria	15095 17710 17910
2110-2200	VOA Pacific Service	9525 11965 15185
2115-2200	Radio Cairo, Egypt	9900
2125-2155 S	Radio Austria Int'l, Vienna	9870
2130-2145	BBC, London, England*	5965 7160
2130-2200	BBC, London, England*	6030 7230 9635
2130-2200	HCB, Quito, Ecuador	15270 17790 21470
2130-2200	Kol Israel, Jerusalem	11605 15640 17630
2130-2200 A,S	Radio Canada Int'l, Montreal	11880 15150 17820
2130-2200 M-F	Radio Canada Int'l, Montreal	13660 15325 17875
2130-2200	Radio Sofia, Bulgaria	11660 15330
2130-2200	Radio Vilnius, Lithuanian SSR	6100
2135-2150 S-F	ELWA, Monrovia, Liberia	11830
2145-2200	Radio Berlin Int'l, East Germany	5965 9730
2150-2200 M-F	ELWA, Monrovia, Liberia	11830

2200-2300	Voice of Free China, Taiwan	18157 USB
2200-2300	Voice of the UAE, Abu Dhabi	9955 15370 15440 17845
2200-2300	WHRI, Noblesville, Indiana	9595 11965 13605
2200-2300	WINB, Red Lion, Pennsylvania	13760 17830
2200-2300	WRNO, New Orleans, Louisiana	15185
2200-2300	WYFR, Oakland, California	13720
2215-2230	BBC, London, England*	11830 13695 15345 21525
2230-2300 A,S	CBC Northern Quebec Service	11820 15390
2230-2300	Radio Mediterranean, Malta	9625 11720
2230-2300	Radio Polonia, Warsaw, Poland	6110
2230-2300	Radio Tirana, Albania	5995 6135 7125 7270
2230-2300	Swiss Radio Int'l, Berne	7215 9480
2245-2300	All India Radio, New Delhi	6190
2245-2300	BBC, London, England	6055 7215 9535 9910
		11715 11745
		3955 5975 6005 6175
		7325 9410 9570 9590
		9915 11785 11945 12095
		15260 15400 17875

2200 UTC [6:00 PM EDT/3:00 PM PDT]

2200-2205 M-F	ELWA, Monrovia, Liberia	3993 11830
2200-2205	Radio Damascus, Syria	15095 17710 17910
2200-2210	Radio Sierra Leone, Freetown	5980
2200-2215 M-A	ABC, Alice Springs, Australia	2310 [ML]
2200-2215 M-A	ABC, Tennant Creek, Australia	2325 [ML]
2200-2215	BBC, London, England*	5965 7160
2200-2215 M-F	Voice of America, Washington	9640 11740 15120
2200-2225	RAI, Rome, Italy	5990 9710
2200-2225	Vatican Radio, Vatican City	6015 9615 11830
2200-2230	ABC, Katherine, Australia	2485
2200-2230	All India Radio, New Delhi	7412 9550 9910 11620
		11715
2200-2230	CBC Northern Quebec Service	9625 11720
2200-2230 S	KGEI, San Francisco, California	15280
2200-2230 S	Radio Austria Int'l, Vienna	9870 11780
2200-2230	Radio Beijing, China	3985 6165
2200-2230	Radio Berlin Int'l, East Germany	5965 9730
2200-2230	Radio Canada Int'l, Montreal	5960 9755 11905
2200-2230	Radio Jordan, Amman	9560
2200-2230 S	Radio Norway Int'l, Oslo	25730
2200-2230	Radio Prague, Czechoslovakia	6055
2200-2230	Radio Sofia, Bulgaria	11660 15330
2200-2230	Radio Vilnius, Lithuanian SSR	6100 7400 11675 11790
		11875 12000 15180 15455
		17665
2200-2245	BBC, London, England	3955 5975 6005 6175
		7325 9410 9590 9915
		11920 12095 15070 15260
		15400 17755 17785

2300 UTC [7:00 PM EDT/4:00 PM PDT]

2300-2330	Kol Israel, Jerusalem	11605 15615 15640
2300-2330	Radio Canada Int'l, Montreal	9755 11730
2300-2330	Radio Mediterranean, Malta	6110
2300-2330	Radio Prague, Czechoslovakia	13715
2300-2345	WINB, Red Lion, Pennsylvania	15145
2300-2345	WYFR, Oakland, California	5950 11580 15170
2300-2350	Radio Pyongyang, North Korea	13650
2300-0000	All India Radio, New Delhi	6055 7215 9535 9910
2300-0000	BBC, London, England	11715 11745
		3955 5975 6005 6175
		7325 9410 9590 9915
		11945 12095 15260 17875
2300-0000	CBC Northern Quebec Service	6195 9625
2300-0000	CBN, St. John's, Newfoundland	6160
2300-0000	CBU, Vancouver, British Columbia	6160
2300-0000	CFCF, Montreal, Quebec	6005
2300-0000	CFCN, Calgary, Alberta	6030
2300-0000	CHNS, Halifax, Nova Scotia	6130
2300-0000	Christian Science World Service	9465 15300 17555
2300-0000	CKWX, Vancouver, British Columbia	6080
2300-0000	CFRB, Toronto, Ontario	6070
2300-0000	(US) Far East Network, Tokyo	3910
2300-0000	KVOH, Rancho Simi, California	17775
2300-0000	Radio Australia, Melbourne	15160 15240 15320 15395
		17795 21740
2300-0000	Radio for Peace, Costa Rica	21555
2300-0000	Radio Japan, Tokyo	11800 17765 21610
2300-0000	Radio Luxembourg	6090
2300-0000	Radio Moscow	11845 12025 12055 17620
		17850 21690 21790
2300-0000	Radio Moscow, (N. American Srv)	9530 9765 11710 11730
		11750 15290
2300-0000	Radio Polonia, Warsaw	5995 6135 7125 7270
2300-0000	Radio Sofia, Bulgaria	11660 15330
2300-0000	Radio Thailand, Bangkok	9655 11905
2300-0000	Radio Tonga, Tonga	5050
2300-0000	SBC Radio One, Singapore	5010 5052 11940
2300-0000	Superpower KUSW, Utah	15580
2300-0000	Voice of America, Washington, DC	15290 17735 17820 18157
		USB
2300-0000	Voice of the UAE	6170 9595 11985 13605
2300-0000	WHRI, Noblesville, Indiana	13760 17830
2300-0000	WRNO, New Orleans, Louisiana	13720
2315-2330	BBC, London, England*	11820 15390
2330-0000 M-A	Radio Budapest, Hungary	6110 9520 9585 9835
		11910 15160
2330-0000	Radio Canada Int'l, Montreal	9955 15370 15440 17845
2330-0000	Radio Kiev, Ukrainian SSR	11675 11790 11875 12000
		13645 15180
2330-0000	Radio Korea, Seoul, South Korea	15575
2330-0000	Radio Tirana, Albania	9760v
2330-0000	Voice of Vietnam, Hanoi	9840 15010
2330-2355 M-A	BRT, Brussels, Belgium	9925
2335-2345 M-A	Voice of Greece, Athens	9395 9420 11645
2345-0000	BBC, London, England*	3915 6080 7180 9580
2345-0000	Radio Berlin Int'l, East Germany	6080 11890
2348-0000	WINB, Red Lion, Pennsylvania	15145

The Lowe HF-225

The Lowe HF-225 replaces the Lowe HF-125, which are English-made tabletop receivers for AM and shortwave.

The '225, like its predecessor, is a compact communications receiver -- what's known in computer circles as having a "small footprint." So it takes up very little room on your desk. This small size also allows it to second as a portable, if the right options -- NiCd battery pack, active antenna and carrying case -- are purchased.

The cabinet's color scheme has also been changed. Indeed, it does look better. But the '225, like Sony's discontinued but excellent ICF-6800W, has all the sex appeal of one of Aunt Prunella's shoe boxes. It's what the British call "sensible."

Simplified Operation

To begin with, the '225 has remarkably few controls. There are only four knobs -- including a big tuning knob -- and five round pushbuttons. That's only nine controls in all, as compared with the dozens found on some Japanese radios. There's also an analog signal-strength meter.

The keypad, which is optional, is outboard... and it really works well. If you want to hear the BBC on 5975 kHz, you just tap in 5-9-7-5, and that's all there is to it. There's no fooling around with "enter" keys, leading zeroes, decimals, or any of the time wasters found on other keypads.

First-Rate Audio Quality

The '225 sounds very good for a communications receiver. If we look at the lab measurements we just did, we see that distortion is consistently less than one half of one percent.

This is the sort of fidelity you expect to find on hi-fi equipment. When you hook up a good speaker to this receiver -- and Lowe offers a Wharfedale Diamond III speaker as an option -- it sounds first-rate.



Good performance and tough construction but few 'bells and whistles'

Four (!) Voice Bandwidths

Another thing that helps this set sound so good is that it comes with no less than four voice bandwidths -- 2.3, 5.6, 9 and 11 kHz -- from which to choose. Most receivers come with only two, so this is a real plus. And they work very well -- top-drawer skirt and ultimate selectivity -- thanks to some innovative engineering on Lowe's part.

Of the four bandwidths, the widest is good for listening to local AM stations, while the other three work nicely for the varying conditions found on shortwave.

Built Tough, with Able Performance

Another advantage of the '225 is that it is built to almost professional standards of ruggedness. Inside is a pair of thick cast-aluminum side panels, and all the other panels and covers aren't plastic -- they're heavy-gauge stamped aluminum. You just don't expect to find this level of construction quality on a model selling for \$600. Indeed, in many ways this set is better built than Japan Radio's \$1,350 NRD-525 superset!

Although the '225 has a number of

small improvements over the '125, the main thing is that the synthesizer has been upgraded considerably. This is an important improvement that makes the set perform better in several ways.

That's the good news. The bad news is if you want "bells and whistles," you should look elsewhere. The '225 doesn't have any notch filter, passband tuning or scanner, and the frequency readout is only to the nearest kilohertz, even though the synthesizer tunes in precise -- if unusual -- 8 Hz increments. The paucity of controls can actually complicate things a bit, too, when you're switching modes and things like that.

Also, sensitivity is a bit less than DXer's are going to like. This is typical of nearly all sets designed in Europe, where signal strengths are so great that if a set -- even a good one -- is too sensitive, it will tend to overload. Fortunately for those of us in North America, Palomar, MFJ and others make active preselectors that take care of this, and then some.

The decay and attack times of the automatic gain control are both just a bit slower than they could be for best results on shortwave. However, that decay time -- as well as the set's excellent stability -- are nigh ideal for reception of single-sideband signals.

COMPUTERIZE YOUR SHACK

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KENWOOD: TS-940, 440, 140, R-5000, 680, 711, 811

YAESU: FT-767, 757 GXII, 757 GX, 747, 9600, 736

JRC: NRD 525

COLLINS: 651 S1

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Synchronous Detector Reduces Fading Distortion

You can also get an optional synchronous detector, such as is found on the Sony ICF-2010 and ICF-2001D, or Grundig's new Satellit 500. This makes the '225 the only tabletop receiver under \$1,500 on the market with synchronous detection. But the '225's doesn't allow individual sidebands to be selected, and so it is of limited use except for listening to AM stations during the day or the few shortwave stations that are "out in the clear."

Fortunately, because the set already has excellent audio and the ability to select sidebands manually, the '225 works well without the optional synchronous detector. But even with its limitations, our listening tests found that the optional synchronous detector reduced selective-fading distortion noticeably on certain types of shortwave and mediumwave AM signals.

In the United Kingdom, the '225 sells for 344 pounds, plus VAT -- which is 30 pounds less than the old '125 did. As of press time, no firm in the US or Canada

carries it yet, although Electronic Equipment Bank, Universal Shortwave and others are reportedly considering it. Still, it can be ordered directly from the manufacturer: Lowe Electronics, Chesterfield Road, Matlock, Derbyshire DE4 5LE, England.

In our case, we paid a US customs duty of \$28, so the total bill for the radio, air freight and duty comes to just over \$600, which is awfully reasonable for a set of such quality construction and that sounds this good.

A catalogue of these reports may be obtained by sending a self-addressed stamped envelope to International Broadcasting Services, Ltd., Box 300M, Penn's Park PA 18943 USA.

MAGNAVOX UPDATE

Magnavox tells us that their compact little portable, the D1835, is being replaced by the D1875. The price remains unchanged. In fact, so will the radio, for the most part, except for restyling. Outside the US, this will be sold as the Philips D1875.

However, of greater import is that the super-value Magnavox D2935 has reportedly also been discontinued. We haven't had any official word on this as yet from the manufacturer, but we do know that something new is scheduled to come out shortly from Philips and Magnavox to replace the D2935 and/or the larger D2999 models.

You can hear Larry Magne's equipment reviews the first Saturday of each month, plus PASSPORT editors Don Jensen and Tony Jones the third Saturday, over Radio Canada's "SWL Digest." For North America, "SWL Digest" is heard at 8:10 PM ET on 5960 and 9535 kHz, with a repeat Tuesday at 8:30 AM ET on 9635, 11855 and 17820 kHz.

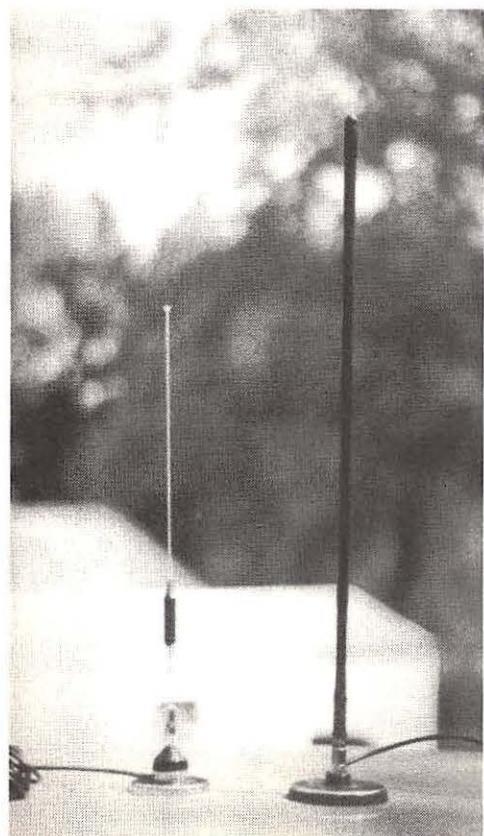
PASSPORT'S "RDI White Paper" equipment reports contain everything found during its exhaustive tests of communications receivers and advanced portables. These reports are now available in the US from Universal Shortwave and EEB; in Canada from PIF, C.P. 232, L.D.R., Laval PQ H7N 4Z9; and in Europe from Interbooks, 8 Abbot Street, Perth PH2 0EB, Scotland.

MAXRAD Mobile Scanner Antenna

Looking for a good, high band/UHF/800 MHz, magnetic-mount scanner antenna that won't tip your car over in a strong wind? You will be pleasantly surprised with the performance of the MAXRAD MAX-SCAN 1000, available for \$49.50 plus \$3.50 shipping from Northern Door Communications, PO Box 44, Sister Bay, Wisconsin 54234.

Measuring a scant 18 inches in height and made of stainless steel, the professional whip comes with approximately 12 feet of RG58/U and your choice of BNC or Motorola connector factory installed. A base version with radials but no coax is available for \$49.95.

MAXRAD (left) vs. Grove ANT4 (right) -- both excellent in their intended frequency ranges



Let's Test It

The MAX-SCAN 1000 was placed atop a van and separated four feet from the Grove ANT4 as a reference antenna. A 250 mile round trip provided ample time to test both antennas which were occasionally switched in position for an objective comparison.

On VHF high band (144-174 MHz) and UHF (450-512 MHz) performance of the antennas was identical. At 800 MHz (830-900 MHz) the 1000 appeared to have slightly better signal strength; at low band (30-50 MHz) the ANT4 was clearly superior.

These results might have been expected; the MAXRAD has a tuned element for 800 MHz, but no provision at all for low band reception. The Grove unit has a low band element, but depends upon a resonant harmonic of the VHF element for 800 MHz applications.

The 1000 boasts mid-band VSWR of under 2:1 for transmitting applications (up to 200 watts) at 150-174, 440-470 and 800-840 MHz. The antenna provides good reception to the edges of those bands as well.

There is no clear superiority of one antenna over the other for most listening applications. For low profile (and neatest appearance), or where low band is not a prime concern, or if 800 MHz is an important consideration, the 1000 would be the obvious choice.

However, if good low band performance is important and you can tolerate the longer (25 inch), thicker (1/2 inch fiberglass helix) antenna, the ANT4 makes sense. Both antennas provide excellent mobile scanner reception over their intended frequency ranges.

Ohio R&D "Raven" Scanner Antenna

It is always a pleasure to test a new antenna that combines wide frequency coverage, small profile and reasonable cost. Such is the Raven from Ohio R&D. This two-foot-high ground plane houses a proprietary design within its upper PVC element housing.

Intended to outperform the discones now on the market, the Raven advertises 100-900 MHz frequency coverage with an average 4 dB gain. It is available with either an N or SO-238 (female UHF) connector.

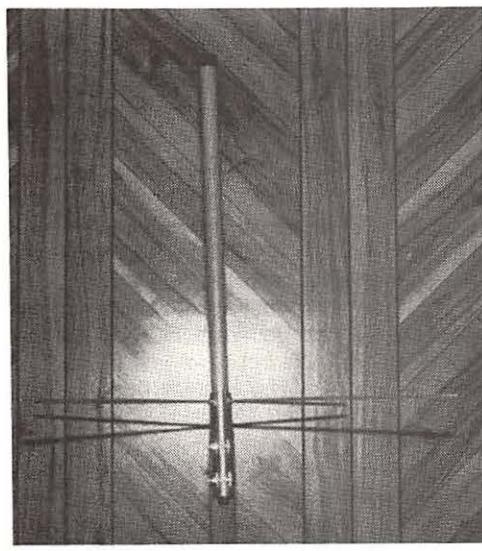
Construction is rugged, featuring heavy-duty aluminum tubing at its base and schedule 40 PVC for its upper element housing. Its total height is a compact 27 inches and radials are 14.75 inches in length.

Running it through its paces

Assembling the Raven is a breeze: simply remove it from the box and screw in four threaded ground-plane radials. Any convenient U-bolts will affix it to a conventional mastpipe.

While Ohio R&D compared their Raven to a discone, we decided to compare it to the Channel Master 5094 Monitenna, an inexpensive scanner antenna which we have repeatedly found to be superior to any other omnidirectional antenna on the market.

Keep in mind, however, that the two antennas were not mounted on identical mounts or at identical heights, and the 5094 exhibits some directivity due to its



The Raven -- a variable, omnidirectional, and discreet outdoor scanner antenna

construction. Your results are bound to differ somewhat from ours.

Low Band

Below 100 MHz, just as advertised, the Raven was decidedly inferior to the 5094. This was to be expected; the 5094 is a vertical dipole cluster with resonant elements for the 30-50 MHz range. Even so, reception from the Raven in this range would be acceptable in a short-range urban environment.

High Band

In the 144-174 MHz range, both antennas were comparable, although the 5094 did show a slight edge below 160 MHz. Compared with a discone, however, the Raven would be superior.

UHF Military Aeronautical Reception (225-400 MHz)

Comparing satellite signals in the 240-270 MHz range, we found that the Raven did not work well at all on this band. Performance here is of no consequence, however, to scanner listeners uninterested in UHF military aeronautical reception.

UHF Land Mobile

The 406-512 MHz range is as heavily populated in major metropolitan areas as high band. We found the two antennas to be roughly comparable here with the Raven

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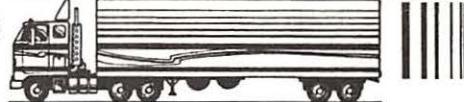
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giving its best performance at the lower end of this frequency range.

800 MHz

Unfortunately, here in the mountains of Western North Carolina, the 800 MHz band has not yet been discovered, so we were unable to make any tests in this part of the spectrum. We did note, however, that 1090 MHz DME data bursts from aircraft, weakly receivable on the 5094, were inaudible on the Raven.

The manufacturer's own test results claim the Raven to be vastly superior to the discone in the 800 MHz band. We have no means of corroborating this.

Conclusions

All points considered, the Raven is a viable, omnidirectional, outdoor antenna for the scanner listener who wants good reception without calling attention to the fact that he is listening. We would not hesitate to recommend it for the vast majority of scanning applications.

The Raven scanner antenna is available from Ohio R&D, 5421 Hickory Court, Lewisburg, OH 45338.

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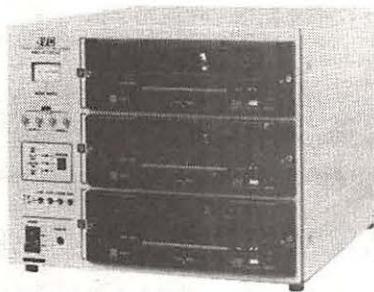
The consumer electronics industry accounts for more than \$43 billion in U.S. retail sales. No other industry has greater impact on our daily lives. For example, more than 98 percent of all American households have at least one TV, 61 percent have a VCR and 90 percent have an audio system.

This year marks the 50th anniversary of television. Although retail prices for most U.S. goods and services have increased, the index for such consumer electronics products as television has actually decreased.

This information and much more is available in the 1989 Annual Review -- Entertainment and Education, Yesterday, Today and Tomorrow, which provides an introduction to one of America's most dynamic and innovative industries -- consumer electronics.

Compiled by the Electronics Industries Association's Consumer Electronics Group, this profile and history traces the development of product categories such as video, audio, home information equipment, and personal electronics along with loads of useful statistics.

To get your copy send one dollar to EIA/CEG Communications Department, 1722 Eye Street, N.W., Washington, D.C. 20006.



JVC Introduces Tri-Deck VHS Duplicator

JVC Professional Products has introduced the first three-in-one Hi-Fi-duplicator, which dramatically reduces the cost and complexity of producing multiple HS copies.

The BR-7030U features three individual VHS recording transports built into a single cabinet that occupies only 12 to 15 standard rack units. This is a space savings of some 33 percent over similar units, says JVC.

The JVC BR-7030U requires no additional video, audio or power cables and works with the same number of video and audio distribution amplifiers as a single VHS duplicating machine. In addition, it operates on one third the number of cables, features that add up to a total systems savings of 60 percent.

The BR-7030U is available for \$4,995.00 from JVC Professional Products, 41 Slater Drive, Elmwood Park, NJ 07407.

New Portable Data Terminal

Panasonic's newest portable data terminal, ear-catchingly called the KX-D4915, features a built-in 300 baud modem, a 26-station auto dialer and a bi-directional thermal printer.

Because of the internal modem, the KX-D4915 is compatible with a wide range of computer networks. A Bell 212A interface port is provided.

The use of a 26-station Auto Dial/Auto-log and/or Message Storage function provides users with storage space for a maximum of 26 different data bases. It also allows you to store telephone numbers and names while the auto log-on provides storage for log-on steps and/or messages.

Documents are printed using a bi-directional thermal printer, a non-impact device capable of pumping out



some 60 characters per second.

A full ASCII keyboard is included. Retail price for the KX-D4915 is \$879.00.

Entertainment on the Wing

Before long, airline passengers will be able to crank up their own miniature cable television system right on the back of the seat in front of them. Viewing choices will include everything from cartoons to full-scale feature movies.

Programs for the units are changed monthly. Eventually, the system is also expected to make available flight information, hotel and rental car reservations, and to help with onboard teleshopping.

The system under test is called "Airvision" and it features a 3-inch liquid crystal display television that allows the passenger to dial up the entertainment of his choice. Because it is mounted on the back of the seat in front of the passenger, the entire cabin doesn't have to watch the same thing and it won't be necessary to tell other passengers "lights out" when a program is running.

Airvision has been successfully tested by Northwest Airlines on its Detroit to Tokyo leg with 89 percent of passengers rating the system good to excellent. Other tests of Airvision are being conducted by British and Quantas Airways.

Airvision is a joint venture of Warner Bros. in the United States and Philips in The Netherlands. (Walt Lang, Defense Activities)



To have your new product or book considered for review in *Monitoring Times*, send it to Editor, 140 Dog Branch Road, Brasstown, NC 28902.

An Apartment Dipole

Apartment dwellers face a continuing dilemma: How can an effective antenna be erected that won't have other tenants calling special meetings? With so many limitations on height, clearance, frequency range and interference, is such an antenna feasible? Yes and no.

No indoor antenna will work as well as an outdoor antenna, but the farther outdoors we get that indoor antenna, the better. Urban Antennas has devised an adjustable dipole, intended for amateur and CB frequencies between 21 and 30 MHz, with a universal base for a variety of mounting configurations.

Comprised of several pieces of hardware (flag mounts, aluminum conduit, aluminum wire, hose clamps) and mounted on a hardwood base, the model A10-15 is easy to assemble by following the step-by-step instructions.

Fully assembled, the antenna is a center-fed, half-wave V-dipole resembling a giant pair of rabbit ears. For temporary mountings, a sturdy, adjustable screw-vise clamp is included to allow fixing the antenna to any convenient prominence. A female UHF (SO239) connector is included for attachment to a standard PL259-equipped length of 50 ohm coaxial cable.

Trying it Out: Our first test was to temporarily mount the Urban dipole in a vertical position on the side of a Rohn steel tower; the lower element was only a few feet off the ground. Setting the elements to the length specified for CB, we fired it up on that band using an MFJ 986 tuner (transmatch) for power and VSWR measurement.

It was immediately apparent that the voltage standing wave ratio (VSWR) was quite high, probably due to the close proximity to the earth and the metal tower. We moved it up the tower about ten feet. While that helped, the VSWR still remained high, improved only by lengthening the dipole elements unrealistically or putting the transmatch in line.

Removing the dipole from the metal tower, we then set it horizontally on a wooden porch railing, well away from the tower and the metallized foam installation of our home. This tamed the VSWR considerably.

CB signals were loud and clear; bandwidth for low VSWR (under 2:1) was more than 1 MHz (wider than the entire CB band), assisted by the capacity "hats" at the ends of the

elements. It was apparent that the antenna would work well without a transmatch ("antenna tuner"), but only away from metallic masses which affected its characteristic impedance.

Other Observations: The manufacturer suggests that the A10-15 can also serve as a scanner antenna due to its thick elements; this allows harmonic frequencies (multiples of the design frequency) to be heard efficiently.

This is true — up to a point. A center-fed dipole is an efficient gatherer of signals at odd harmonics (*NOT* even!), but its impedance gradually rises with higher and higher harmonics, and the dipole becomes more and more directional off the ends. The A10-15 is not a substitute for a properly designed scanner antenna.

The manufacturer also recommends the A10-15 for shortwave listening. It will work there, but because of its comparatively short length, not as well as a 20 foot or longer random wire.

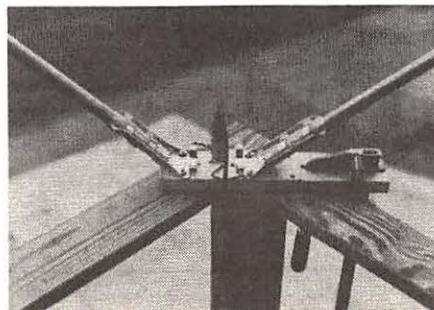
The Urban antenna comes with nylon safety cords to prevent elements from working loose and falling. A set of instructions includes a number of mounting hints, such as the recommendation to strap the antenna to a tree with bungee cords or to a chimney — both good locations.

We would recommend the Urban antenna for temporary use such as vacationing, camping and other applications where the unit is periodically disassembled and relocated. Because the base is made of untreated hardwood, moisture could be a problem, especially at VHF and UHF frequencies.

It would be a good idea to weatherproof the wooden base. In the "olden days" this would have been accomplished by covering it with shellac or soaking it in hot paraffin.

For transportable 10, 12 and 15 meter amateur applications or 27 MHz CB, the Urban A10-15 provides an alternative to making an antenna from scratch or purchasing a less-easily-disassembled commercial antenna.

The Urban A10-15 apartment antenna is available for \$89.50 from Urban Antennas, Box 662, Bryn Athyn, PA 19009.



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A Simple, Sensitive SWR Indicator



There is no need to invest your money in an SWR indicator when you can build one for less than \$5.00. This type of instrument has many uses, but the major one is associated with antenna adjustments and impedance matching.

Whether you're experimenting with transmitters for Part 15 of the FCC rules, or in need of a bridge for antenna adjustments elsewhere in the radio spectrum, some kind of SWR meter is almost mandatory.

This article treats a low-cost reflecto-

meter style of SWR indicator that uses a somewhat different circuit from those found in run-of-the-mill indicators. This one is patterned after a circuit I developed for *QST* magazine some years ago. I call it the "Varimatcher." It contains a very sensitive SWR sensor, which enables me to measure very low power levels.

Figure 1 shows the circuit for the instrument. The heart of the unit is a section of RG-174/U miniature 50-ohm coaxial cable. There is no reason why RG-58 cable cannot be used, but it is bulky and

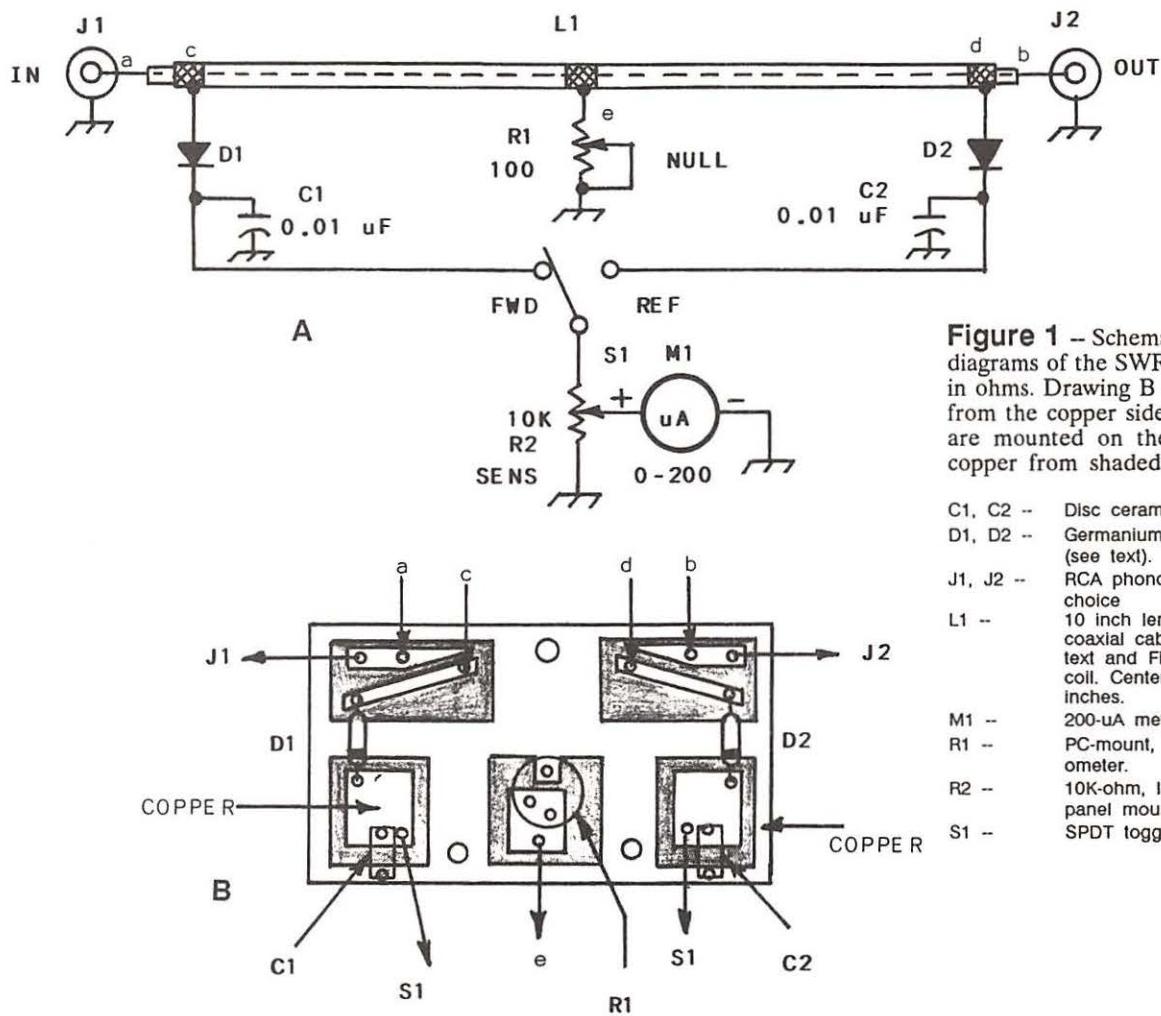


Figure 1 — Schematic (A) and pictorial (B) diagrams of the SWR indicator. Resistance is in ohms. Drawing B is to scale and is viewed from the copper side of the PC board. Parts are mounted on the nonfoil side. Remove copper from shaded areas.

- C1, C2 -- Disc ceramic, 50 V or greater
- D1, D2 -- Germanium signal diode, type 1N34A (see text).
- J1, J2 -- RCA phono jack or connector of your choice
- L1 -- 10 inch length of miniature 50-ohm coaxial cable, type RG-174/U. See text and Figure 2 for details of L1 coil. Center tap shield braid at 5 inches.
- M1 -- 200-uA meter (see text).
- R1 -- PC-mount, 100-ohm trimmer potentiometer.
- R2 -- 10K-ohm, linear-taper carbon control, panel mount
- S1 -- SPDT toggle or slide switch

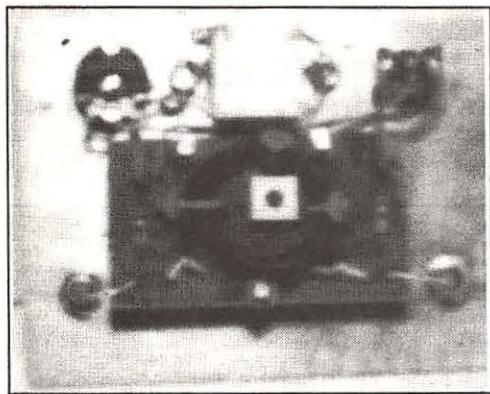


Figure 2 -- Interior view of the assembled SWR sensor. Note that L1 is rolled into a 1 inch OD coil to conserve space.

would take up considerably more space than the smaller RG-174/U line. A small handful of additional components completes the circuit.

The theory of operation is like that of the classical directional wattmeter or reflectometer. The outer conductor of the RG-174/U is center tapped by virtue of the nulling control, R1. Forward current flows along one half of the shield braid, while reflected current is sampled by the other half of the shield braid.

The RG-174/U outer conductor is effectively grounded at RF when the diodes are in conduction. R1 contributes to the grounding of the shield braid, but the control resistance does not allow an effective ground for that part of the line.

The diodes (D1 and D2) at the ends of the line rectify the RF energy that flows along the shield conductor. The resulting dc voltage is observed on M1, a 200-uA dc meter. A 100-uA meter offers greater RF sensitivity, and a 500-uA unit lowers the instrument sensitivity. A 50-uA meter would provide extreme instrument sensitivity.

The length of the line, L1, determines the overall sensitivity. The longer you make L1, the less power it will require to obtain a full-scale reading at M1. I have chosen an arbitrary L1 length for use from 1.5 to 30 MHz.

If you plan to use this SWR indicator for 100-mW transmitters in the broadcast band, you will need to lengthen L1 to approximately 20 inches in order to obtain a full-scale reading in the high end (1400-1600 kHz) of the BC band.

Similarly, if you want to use this instrument at 15 MHz and above, you may shorten L1 to reduce the sensitivity. An L1 length of five inches is suitable.

As is the situation with most reflectometer SWR sensors, the circuit is "frequency sensitive." In other words, the higher the operating frequency in MHz, the lower the RF power for full-scale deflection of the meter (M1).

Germanium diodes at D1 and D2 offer the best sensitivity. Silicon diodes, such as the 1N914 type, are okay too, but they require greater power than do germanium diodes for full-scale meter deflection. For example, when using 1N914 diodes, I found it necessary to feed 4 watts through L1 at 3 MHz in order to deflect the meter to full scale.

Germanium diodes of the 1N34A or 1N60 variety required only 1 watt at 3 MHz for a full-scale meter deflection. Only 10 mW of power was needed at 30 MHz to swing the meter reading to full scale when using 1N34A diodes at D1 and D2. The foregoing readings were obtained with R3 set for maximum sensitivity (fully clockwise).

The component values listed in Figure 1 are chosen for power levels under 10 watts. If you want to use this instrument for power amounts up to 100 watts, shorten L1 to 3 or 4 inches, overall.

Too long a sensing line can cause diode burnout at high power levels. I chose a 10-inch length for L1 in order to provide high sensitivity for laboratory measurements of oscillator and low-level RF amplifier output -- usually under 100 mW. The instrument is ideal for this purpose.

Assembly Tips

Figure 2 shows the innards of the unit. I used a hobby motor and small cone-shaped abrasive bit to cut the PC-board pattern in the copper of single-sided PC board. I drew the pattern with a pencil, then ground out the unwanted copper.

This is a quick and easy way to make a one-shot PC board. It will not be a work of art when done this way, but it will suffice!

L1 is coiled to have an ID of 1 inch. This makes the assembly more compact. I used three plastic cable ties to hold the RG-174/U coil in shape. Masking tape may be used in place of the ties.

R1 is a PC-board trimmer that is mounted at the exact center of the L1 coil. M1 is a surplus 200-uA meter I obtained from John Meshna, Jr. in Lynn, MA.

The PC board, meter, toggle switch, and 10K-ohm sensitivity control are mounted on a 3 X 4 inch scrap of single-sided PC board (metal side in). There is no cabinet for my unit, but you can make one easily from PC-board material.

I painted the front side of the panel with gray automotive spray can primer paint. Press-on decals are used to identify the control functions. I used RCA single-hole mount phono jacks for J1 and J2 of Figure 1. You may prefer to install SO-239 UHF or BNC connectors.

Instrument Calibration

Connect a 50-ohm resistive load, such as a 2-W, 47-, or 56-ohm carbon resistor from J2 to ground. Set R2 for minimum sensitivity and apply 1 watt or less of transmitter power.

Greater power may be used if you connect a higher wattage dummy load at J2. Adjust R2 for a full scale meter reading with S1 in the FWD mode. Now, switch to REF and adjust R1 for a zero meter reading. Stop adjusting R1 as soon as the meter needle drops to zero.

Do not go beyond this point because the meter will not respond well to reflected power. Normally, the resistance value for R1 will be on the order of 35 ohms when the desired null is reached.

Now reverse the dummy load and transmitter ends of the SWR meter. Check to see that a full-scale M1 reading occurs in the REF mode. A zero reading should occur when S1 is switched to read FWD. This completes the calibration.

Closing Comments

This project can be fun to build. You may want to experiment with the construction by using a piece of 1/4 inch copper pipe for L1. If you do this, insert the inner conductor and its polyethylene insulation from a piece of RG-58 coaxial line in the copper pipe. This will make a rigid sensor line.

You may bend it into a U shape to conserve space. It can also be bent into a circular format. The primary consideration is to keep all RF leads as short and direct as practicable.

100 More Channels for the Icom R-7000

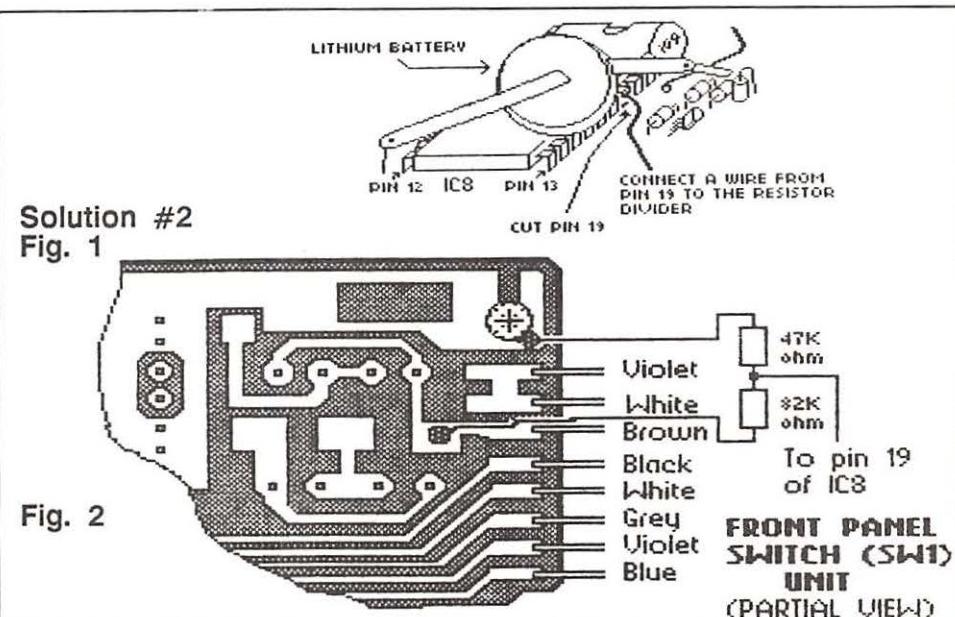
The Icom R-7000 is one heck of a good radio. Much more than just a scanner, the R-7000 microwave communications receiver is designed for the serious VHF/UHF listener. Frequency coverage from 25 MHz to 2 GHz and multi-mode operation makes the R-7000 a benchmark receiver.

As with any commercial receiver, there are some things that can be done to improve performance and make the receiver much more effective and efficient to use. In this month's Experimenter's Workshop, we'll show you some modifications to the R-7000 that will definitely improve this top-notch receiver.

As with any modifications to a piece of electronic equipment, they should be performed *only* by qualified electronic technicians familiar with soldering in hi-density circuits. In addition, the ICOM service/maintenance manual for the R-7000 is a must.

It tells the locations of all the parts, shows board locations, pictorials, and how to pull the receiver apart. It is the definitive source of information on the radio and well worth the investment. Anyone undertaking these modifications without the service/maintenance manual is asking for trouble.

How would you like an additional 100 channels of memory? A very simple addition of one resistor and a switch will enable an additional 100 memory channels. The second



bank of 100 channels cannot be scanned in sequence with the original 100 channels, but they will be available as a separate bank of channels that will double the existing memory of the R-7000.

Here's how it works:

1. Locate RAM chip IC-8 (uPD446C).
2. Cut the trace from pin 19 to ground (this

- will leave pin 19 high).
3. Solder a 47 K (47,000 ohm) resistor from pin 19 to the 5 VDC buss appearing on pin 24 of IC-8.
4. Connect an SPST switch (toggle or push button) between pin 19 and ground.

When the switch is closed, it pulls pin 19 low and emulates the original configuration. With the switch open, pin 19 is pulled high and channels 100-200 are enabled. Now you have an R-7000 with 200 memory channels for less than \$2.00 worth of parts. Not a bad trade-off!!

Mounting this switch could be a problem. Drilling holes in a \$1000 radio is NOT the way to insure its resale value. With that in mind, we'll present another way to obtain these extra 100 channels.

Jack Albert checks in with this solution to obtaining an additional 100 memory channels. While it is similar to the aforementioned mod, it is a bit more detailed and uses the "Remote" button to shift to the new channel bank. If you have the remote controller option, RC-12, installed, you will have to control volume with the remote unit when the new channel bank is selected. So here's Jack's solution to the second channel bank addition:

Parts needed: one 47 K resistor, one 82 K resistor, and six inches of #20 guage wire.

1. Remove the bottom cover of the radio and the logic board cover plate.
2. With the front of the radio facing you, locate the uPD446C RAM chip, IC-8.
3. Locate pin 19 which will be connected to ground along with pin 20. NOTE: the lithium battery may be in the way, so gently

Welcome to Column No. 1

Welcome to my first "Experimenter's Workshop" column in *Monitoring Times*. Allow me to introduce myself. My name is Rich Arland. I'm 43 years old, married to a terrific lady named Tricia who puts up with me, my crazy radio hobby, and my lunatic fringe friends.

I have been licensed as a ham radio operator (K7YHA) since 1963, and hold an Extra Class license. As a father of four, I had high hopes that my children would eventually obtain their ham licenses, but, alas, only Wendy (KB4UNT) has humored her father thus far.

In addition to low power (QRP) ham radio, I also enjoy SW Listening and DXing, and I'm a dedicated scanner fanatic. My faithful DX hound (a Golden Retriever pup named Ozzie) is a dependable alarm clock who awakens me around 4 a.m. every morning. He needs to make his morning constitutional around the yard which allows me time to check the SW bands for interesting DX.

Currently I'm working for the Student Loan

Marketing Association in Wilkes-Barre, Pennsylvania, as head of their technical services department. In 1987 I retired from the USAF after 20 years active duty in long-haul and tactical communications. Out of my 20 years in the Air Force, 15 were spent in exotic overseas locations including Japan, Azores, and England.

So much for the mini-biography. Now some words about the column. The main purpose of Experimenters Workshop is to provide a technical information forum for hams, SWLs/DXers, and scanner buffs to enhance their involvement and enjoyment within the hobby. Each month we'll explore some topic of interest which will be of a technical nature.

My personal philosophy is that this is YOUR column. In order to make it succeed, I'm going to have to have YOUR input. If you have a modification to a radio (HF, scanner, or CB set), pass it along and we'll try to get it in print.

If you have a specific question, send that in also, and I'll give it my best shot and publish the answer for the benefit of all. To summarize, I need to hear from YOU to make this column a success. Don't let me down.

Monitoring Times invites you to submit your favorite projects for publication. For more information, contact Rich Arland, 25 Amherst, Wilkes-Barre, PA 18702

- bend it until it clears pin 19 (see Figure 1).
4. Using small wire cutters, cut the pin 19 next to the PC board. You will need to solder to this pin, so don't cut it too close to the body of the IC. (NOTE: an alternate method would be to use an X-acto knife to cut the trace on the PC board between pins 19 and 20.)
 5. Locate the SW1 switch PC board (behind the row of switches that are on the left of the tuning knob). The remote switch is mounted on the lower right hand side of the SW1 PC board.
 6. Connect the voltage divider circuit (made of the 47 K and 82 K resistors) to the PC board as shown on Figure 2.
 7. Connect a wire to the junction of the two resistors and then run this wire to pin 19 of IC-8 and solder in place.
 8. Re-install the cover plate and the bottom cover of the radio. This completes the mod.

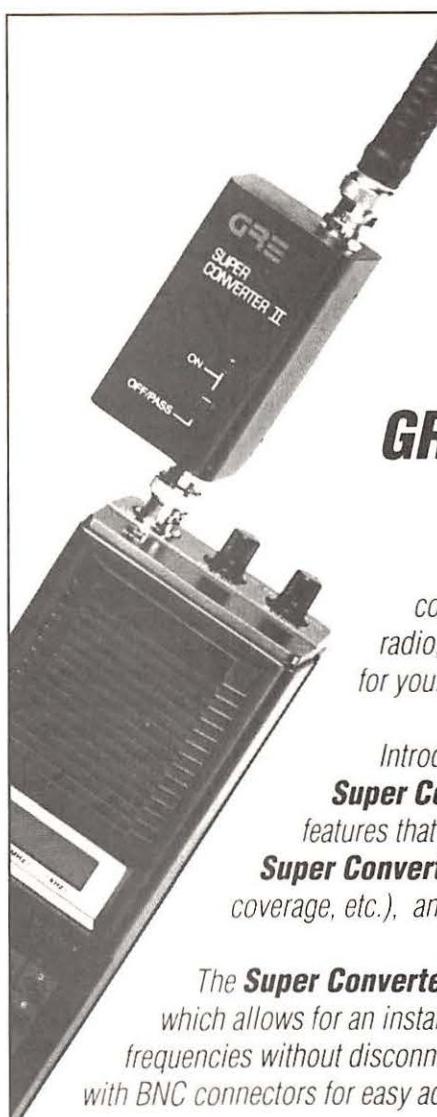
Turn on the receiver and push the "Remote" button (the REMOTE LED should light) and rotate the memory select knob. You should see two decimal points and the memory number on the display.

Now enter a frequency using the keyboard, press the appropriate mode, and then the WRITE button as if you were programming a new radio. You can write in as many new frequencies as desired (up to 100) and they will remain in memory in the "new" channel bank.

Push in on the "Remote" button again (the REMOTE LED should go off) and turn the memory knob. Now you should see the frequencies and modes previously stored in the memory prior to the mod. This mod enables a second bank of 100 channels and really improves the performance of the R-7000.

Our final offering for the R-7000 is not a mod but a reprint of an ICOM service bulletin to cure problems in the DC to DC converter and display power supply. As with the previous two mods, this procedure should be undertaken only by experienced technicians who are familiar with soldering on hi-density circuit boards.

1. Remove the top and bottom covers from the R-7000.
2. Remove the front panel sub-assembly from the main chassis of the radio. NOTE: refer to the service/maintenance manual for details.



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3. Remove the DC to DC board and replace Q1 and Q2 with 2SC 2655 transistors (part #906-00385).
4. Replace R1 and R2 with 5.16 K ohm resistors (part #915-01173) and C3 and C4 with .001mf 50V ceramic caps (part #918-01500).
5. Re-install the DC to DC board.
6. Remove the display board.
7. Replace Q11 and Q12 with 2SC 2655 transistors (part #906-00385).
8. Replace R31 and R32 with 5.16 K ohm resistors (part #915-01173) and C13 and C16 with .001mf 50V ceramic caps (part #918-01500).
9. Replace the display board, re-install the front panel sub-assembly onto the main chassis of the radio, and re-install the top and bottom covers.

This completes the upgrade to the DC to DC converter board and the display board which should prevent any failures. My thanks to Jack Albert for providing the excellent modifications for this radio.

That's a wrap for this month, gang. Be back next month with some more good stuff. In the meantime, if you have a favorite mod or idea that will fit into this column, don't hesitate to write and we'll try to get it into print for all to use. 73s es Gud DX.

The "Lop-Eared" Rabbit - A Tunable VHF Antenna

This month we'll take a look at an easy-to-make antenna which is tuneable over approximately the top half of the VHF band (for scanners, the most useful portion of that band). This antenna is a variation on our old friend, the vertical groundplane antenna, and is a good performer in areas of fair, moderate, or strong signal level.

The "rabbit" part of the name comes from the fact that the antenna is made from a "rabbit ears" TV antenna. The "lop-eared" part is an allusion to the fact that the two "ears" of the antenna are usually set to different lengths, giving a "lop-eared" look to the antenna. Let's see how one is built and used.

Parts List for the Lop-Eared Antenna

- a. one rabbit-ears TV antenna
- b. one 5 to 6 foot length of 50-ohm coaxial cable with RF connector to fit your scanner
- c. two 3 foot lengths of insulated wire

Some Surgery on the Rabbit

A rabbit-ear TV antenna comes with a length of 300-ohm twinlead cable attached to the base-end of the two telescoping antenna elements. For the new antenna you will make of the old rabbit ears, both of the two telescoping elements will be connected to the center conductor of a

coaxial lead-in cable. A good way to make that connection is by cutting the old twinlead about two inches from where it joins the elements.

Put the rest of the cable in your junk box. Then use the two inch bit of cable left attached to the elements as a means of attaching those elements to the new lead-in cable which you will install on the lop-eared antenna. See Figure 1.

You will have to trim the insulation off the end of the remaining two inch length of the old cable in order to make the new connection. Once the insulation is removed, the wires should look clean and metallic. If you are unsure whether they are clean, scrape them a bit with a knife or even sandpaper to brighten them.

Attaching the Coax Lead-in Cable

Start preparing the antenna-end of the coax by carefully cutting off about two inches of the outer insulation on the coax. Then you need to get the inner conductor of the coax out of the braid where you can work with it. This can be done by teasing a hole in the coax braid, near where the outer insulation starts, and pulling the inner conductor through. If you'd rather, you can unbraid the outer shield to expose the inner conductor. Either way will work fine.

Once you have the inner conductor of

the coax out where you can work with it, trim its insulation back to expose about one inch or so of the inner conductor wire. Check the wire and make sure it is clean, as discussed above. Then twist the end of the inner conductor wire together with both the exposed ends of the short piece of twinlead cable wire you prepared earlier. Be sure to leave enough slack in the wires attached to the elements so that the elements can be moved on their pivots without breaking the wires.

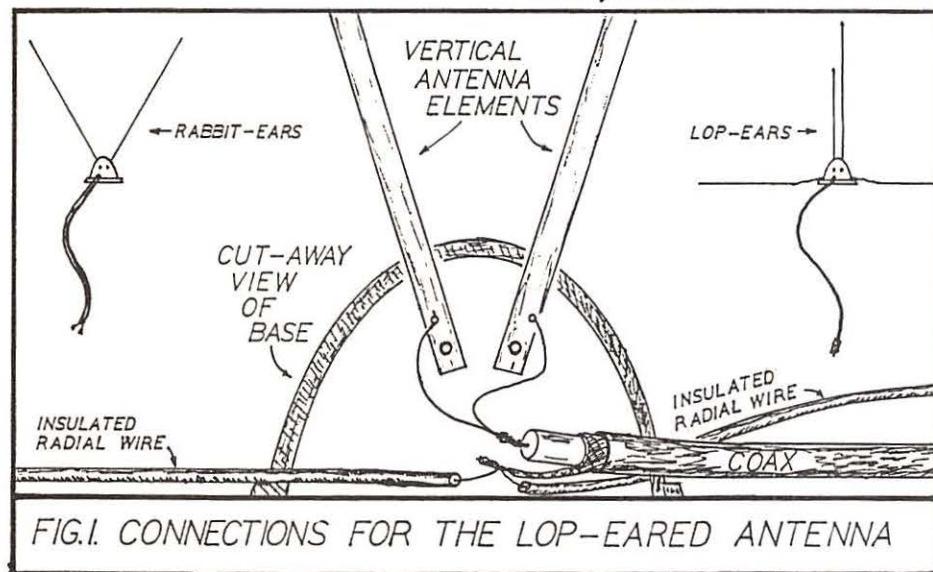
If you can solder this connection, great. If you can't, then wrap the wires tightly together, bend them together in a lump, and crimp the lump together with a pair of pliers. Once you have made the connection secure, wrap it well with plastic electrical tape.

Next, prepare two insulated wires about three feet long. A length of AC zip cord, pulled apart, to make two separate wires, is a good source for these wires. Remove about one inch of insulation from one end of each wire. Now wrap these two ends together with the shield of the coax, and either solder the three of them together, or lump and crimp them as described above. Cover this connection, and any exposed coax braid, with plastic electrical tape.

To Finish the Antenna

Run the coaxial cable out of the base of the antenna. For this you can use the hole which originally was used for the same purpose by the old twinlead cable (which is no longer used). If the old twinlead didn't have a hole for exiting the base (some just run out under the bottom of the base) drill a hole in the base to let the coax exit. You also may need to make two small holes for the insulated wires to exit the base. Put these holes opposite one another near the bottom of the base.

It is probably best to epoxy the coax and insulated wires to the base where they exit, so that they can't slide back and forth through the hole, and cause the wires inside to break. Temporarily, they can be taped in place, if you don't wish to glue them. Now put an RF connector appropriate to your scanner on the far end of the coax, and the antenna is finished.



Using the Antenna

Set the antenna in a convenient location, and run the two insulated wires horizontally out of the base in opposite directions to one another (i.e., they make a straight line). If you can't run them straight or horizontally, do the best that you can. For lower frequency VHF stations, use longer lengths of the telescoping elements, and for higher frequency signals, make the elements shorter.

With two elements, one set short and one set long, the antenna will have a broader bandwidth than with a single element. Try various combinations and see what works best for you. Remember, with strong or moderately strong signals, any setting should work OK. For the weaker signals, finding a "best length" for one of the elements may be what you need to bring the signals in at listenable levels.

RADIO RIDDLES

Last month I asked, "Alexander Graham Bell, in addition to inventing the telephone, actually invented a form of "wireless" telephony. But his wireless system was not the kind of wireless that led to the development of radio. What was his system and how did it work?"

Were you able to get this one? Bell invented a kind of "wireless" communication system called the "photophone." This device used a beam of light reflected from a diaphragm to transmit voice across distance. Reception was via a selenium cell, battery, and telephone earpiece.

Although this device offers relatively "eavesdropper free" communication, it was never exploited to any extent. Various forms of this device appear in electronic hobby magazines yet today, usually without realizing they should credit Bell as the inventor.

This Month: We've just discussed a rabbit-ear antenna, but have you ever heard of the "big ear" antenna? What is it, and who made it famous? Find the answer to this month's riddle, and much more, next month in your copy of *Monitoring Times*. Til then, Peace, DX, and 73.



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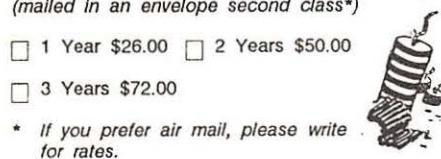
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Q. I have a Realistic DX440, the Radio Shack version of the Sangean ATS803A, and the record jack is deactivated on my version. Can it be made available as on the Sangean? (Paul Stoveland, Bronx, NY)

A. Sure, the boards are the same. Manufacturers delete a useful feature to save a nickel. You should get a schematic first to find out just where to tap the circuit board (I would assume that a solder pad for the connector would be found near the record jack hole).

Q. Are there any DVP decoders on the horizon which will enable a scanner listener to hear digitally-encrypted voice transmissions? (Bob Barczak, Milwaukee, WI)

A. No. Even if you had a Motorola DVP decoder, you would be unable to use it unless you knew the code that had been entered into the transmitting units. One computer expert told me that if he had about 30 minutes of recorded DVP and about two weeks to work on it, he could probably break a particular transmission.

The Electronic Communications Privacy Act appears to have made unauthorized decoders illegal to manufacture or use. Even simple speech inversion descramblers, formerly made by Grove, Capri and DNE, are no longer available.

Q. I'm using the Grove ANT2 Skywire for shortwave listening. I recently attached a TV 300:75 ohm balun transformer between the coaxial cable and the antenna feedpoint, seemingly reducing the line noise somewhat. Will I also improve the directional pattern? (Robert Gallardo, San Jose, CA.)

A. Yes, and you may improve its overall efficiency, too, because it better matches the high impedances found at that feed point. A horizontal wire antenna fed directly by coaxial cable is not a symmetrically-balanced system, so some of the feedline becomes involved in signal gathering. This may result in local electrical noise pickup on the coax shield as well as distortion of the antenna pattern.

Normally, this imbalance is unimportant because you want to pick up whatever signals you can and are unconcerned with pattern symmetry. Many serious shortwave listeners will erect two horizontal antennas at right angles with each other, switching between them for best reception. The antennas won't interact with each other because of their right-angle relationship.

The only disadvantage of using a TV balun transformer is that its performance falls off rapidly below about 3 MHz, making it a poor performer for long and medium wave reception.

Q. I am concerned about the lithium backup battery in my ICOM R71A receiver; what happens if it goes bad?

A. The lithium battery in the R71A keeps the program functions of the RAM alive when receiver power is off. A similar battery in the R7000 is only used for memory, not program. An ICOM spokesman says he is unaware of any failures of the battery due to age which is projected to at least ten years, possibly 20 or more.

In any case, should the R71A backup battery fail, the indication would be the appearance of meaningless digits in the frequency display and general failure of the receiver to respond to any signals.

Should that ever occur, you would remove the bottom cover of the receiver and the screw holding the RAM board in place, and send that board to ICOM for a new battery and reprogramming, at a cost of \$25 and a two-week turnaround time.

Q. Some versions of the Magnavox D2935 portable shortwave receiver have frequency coverage to 30 MHz, others only to 26.1 MHz. How come? (Dennis Mazur, Worcester, MA)

A. Some versions are intended for Mid-European distribution, where reception of law enforcement agencies above 26.1 MHz is unlawful. Apparently some of these get routed to the United States. It would be wise to check the coverage on your proposed receiver before purchasing it.

Bob's Tip of the Month: SHORTWAVE SCANNER INTERFERENCE

With the sunspot cycle cranking up to high output, DX conditions are soaring. Not only are signals more pronounced, but more numerous as well. So much so that they are causing interference to scanners.

Some of the interference is intermodulation, characterized by a combination of two signals mixing in the scanner and being heard simultaneously on one frequency. For example, 15.500 and 15.600 would be heard on 31.100. Since the broadcasts are in AM, modulation may not even be heard by the FM scanner, resulting in what sounds like a dead carrier.

Another problem is IF throughput, a signal so strong that it is heard directly by

the IF amplifier stage of the scanner. One particularly troublesome signal is that of radioteletype station RFLI in Ft. of France, Martinique. Operating in ARO E3 mode, its strong 10.801 MHz carrier spells real trouble for Bearcats with their 10.800 MHz IF systems.

There are some simple solutions. A 10.8 MHz trap or notch filter will eliminate the IF problem. A sharp-rolloff high-pass filter will take care of both the IF throughput and the intermod. Unfortunately, no commercial products are presently on the market for this. If readers desire such filters, let us know -- we'll see that they become available!

Q. When choosing coaxial cable, I find such specifications as "velocity factor" and "capacitance." How should they affect my decision? (Tony Oreluk, E. Pittsburgh, PA)

A. They shouldn't. Velocity factor refers to how fast a signal moves through the cable as compared with its speed in free space (the speed of light: 300 million meters per second). It is useful for cutting cable to resonant lengths at certain frequencies.

Capacitance per foot may be a useful consideration in choosing a cable for active antennas where impedance matching is a major consideration, but is of no practical significance in choosing a cable for most listening applications.

Additionally, impedance (usually 50 or 75 ohms) is not a consideration either, since virtually any antenna will have wide impedance variations -- often from a few ohms to hundreds of ohms -- over its intended listening range.

Coaxial cable should be chosen for low loss (smallest attenuations as measured in dB per hundred feet), and percentage shielding (to prevent signal leakage and electrical noise pickup).

From a practical standpoint, nearly any kind of coaxial cable can be used for shortwave listening, but VHF -- and especially UHF -- applications require care in selection, especially in runs of more than 50 feet.

Any high quality cable chosen for VHF/UHF scanner monitoring will work well at HF (shortwave), but the reverse is not true. Good scanner cable includes (in descending order) Belden 9913, RG8/U foam, RG-6/U and RG-8/U mini. RG-8/U, RG-11/U, RG-213 and RG-59/U would be the next choice -- all about the same. Don't use RG-58/U for frequencies higher than shortwave.

Q. I would like to add a ferrite loop antenna to my Kenwood TS440 transceiver for broadcast band listening. How do I figure the impedances and number of turns? (Barney Fontenot, San Antonio, TX)

A. First, be sure that the ferrite rod is designed to operate in that frequency range. If the rod has been salvaged from an old radio, it should work fine. While you could simply wrap a few turns of wire around the center of the rod and use it that way, you would be better off tuning it for higher Q and better signal levels.

Initially, wind approximately 50 turns of small gauge, insulated or enameled wire in a single layer around the ferrite rod, tape the ends down temporarily, and solder the wires the rotor and stator of a 365 pF broadcast-band variable capacitor.

Wind another 3 turns around the center of the rod (on top of the other winding is just fine) and connect the ends to the antenna and ground terminals of the receiver. Now tune the variable while listening on the frequency of a known station. A peak in signal strength will indicate that the system is working properly.

If no signal peaking is heard and you have double-checked your connections, try listening above and below the AM broadcast band. If the system is peaking on shortwave stations, you need more turns; if it is peaking of low frequency beacons, it needs fewer turns. Ideally, the signals near 1600 kHz should peak with minimum capacitance and those near 540 kHz at highest capacitance.

Q. I discovered that "insulation" like PVC tape, rubber and tubing changes the electrical characteristics of antennas. How can this be? (Doug Chandler, W. Sedona, AZ)

A. Manufacturers of materials are rarely interested in performance at radio frequencies, only DC and 60 Hz AC lines. At radio frequencies, some amazing things happen. Various fillers like carbon can actually introduce capacitive and inductive effects at these higher frequencies.

During the development of the Grove ANT4 mobile scanner antenna, I was astounded to find that, after I had perfected the number of turns on the winding, placing a black vinyl end cap on the antenna shifted its whole frequency range! Similarly, during the experimental design of a mobile CB antenna, the rig worked just great -- until I put the end cap on!

Generally speaking, stay away from colors -- especially black --

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Q. While scanner frequencies for my home city are relatively easy to get, I can't seem to find any lists for other parts of Newfoundland. Can any of your readers help me? (Victor Stead, 71 Fraser Rd., Gander, NFLD, Canada A1V 1L1)

A. Can any of our Canadian friends help Victor?

Q. The instruction manual that came with my Kenwood R5000 receiver says that the factory installed "time operated scan" can be changed to "carrier operated scan," but doesn't tell how to do it. How can I? (Robert Gallardo, San Jose, CA)

A. While the capability is there, it requires a modification. One MT advertiser, Universal Shortwave, will perform the modification for \$15 plus shipping.

Questions or suggestions sent to Bob Grove are printed in this column as space permits. If you prefer a reply by return mail, you must include a self-addressed, stamped envelope.

LETTERS

continued from page 3

He bent over and bared his (latex) behind to the camera while a woman wearing a cocktail dress and holding a drink, paddled him. This happened in 1987."

"Channel 21 was a pirate TV station that operated off the coast of England in 1984 or 1985. It played mostly obscure music videos, I think."

"KDIL operated out of a van in Phoenix in the late 1960s or early '70s. It played obscure stuff and featured really funny fake commercials for the Mr. Rory's Arizona Baked Hyena Tripe Family Drive-in Restaurant."

"I'd like to know where to find out more about pirate TV. Can you help me?"

Your first bet for pirate and clandestine information is Dr. John Santosuosso's superb column right here in *Monitoring Times*. At one time there was a tiny club devoted to such activities called A*C*E.

However, at one point they ceased publication and we haven't seen a copy of the bulletin since. Does anyone know if this ANARC club is still operating?

"What a great magazine!" says Californian Doug Bender. "I didn't even know about you until I attended the International DX Convention in Visalia, California. I was so impressed that I subscribed."

Thanks, Doug. A subscription is the highest compliment that you can pay us. Another is to tell your friends about *Monitoring Times*.

Anyhow, Doug continues: "regarding Rich Arland's excellent article, I built an audio filter from AFtronics, Inc. called 'SUPERSCAF.' It is based on switched capacitor technology. Available in both kit and assembled form, it is, in my opinion, one of the best audio filters I've ever used. Their address is P.O. Box 785, Longwood, Florida 32752-0785."

Thanks for the tip, Doug. We're always interested in hearing from readers (at P.O. Box 98, Brasstown, NC 28902) about new products and services for the radio hobbyist.

Greg Doerschler of Worcester, Massachusetts, comments on our review of the AR2515. "I enjoyed it," he says, "but was surprised to see that the reviewer had a preamplifier in line when making sensitivity comparisons with an ICOM R7000. The noise figures and sensitivity are largely determined by the preamp specifications rather than the receiver specifications."



Fund-raising has its rewards, as one lucky fellow discovers while posing with actress Heather Locklear.

"For instance, I've made comparisons between my Regency MX7000 and Cobra SR-15 scanners. The Regency shows a slight edge over the Cobra with a preamp installed in the antenna line. When the preamp is removed, the performance of the Regency doesn't change much, but the Cobra drops off significantly."

"A very valid point," says reviewer Bob Grove. "One should never compare two pieces of equipment based solely on their performance with a preamplifier in line.

We did test one with a Grove PRE-3 in line but that was mainly because the PRE-3 has two outputs and thus allows simultaneous comparison of two units. But we also made comparisons without the preamp in line and there were no really significant differences when it was taken out of the circuit."

Luther Crumbaugh has a complaint about *MT*. "For a good many years I have read the columns of Glenn Hauser in other magazines and his own publication. In my opinion, he has a long record of showing antagonism toward Christian broadcasters. In more than one instance he has been vicious about Christian programming in general and HCJB and KGEI in particular."

"My point," says Luther, "is that *Monitoring Times'* attitude toward Christian broadcasting has been open. It was

therefore with some concern that I saw his column start in *MT*. His first few months were pretty free of bashing and I was sure that you had an understanding with him. In the May issue, however, the old Glenn began to show."

"Your magazine is not enhanced by this kind of "cheap shot" writing. The good done by these people [HCJB, etc.] can easily stand up to all the Hausers of the world."

Luther, I think you summed it up right nice.

Arnold Hartley of Port Washington, New York -- you may remember Mr. Hartley as the author of the introductory article in the 1987 *Passport to World Band Radio* -- makes a similar comment though he does not specifically address Mr. Hauser.

"*Monitoring Times* gets better all the time. But I do think that your writers ought to forget about the personal axes they want to grind, political or otherwise. The whole field is fascinating enough without these extraneous personal opinions."

There is a bright light in all of this. Compliments continue to pour in regarding the improved program guide in *Monitoring Times*. And if you happened to get *USA Today* a couple of weeks ago, you'd have noticed the man responsible for

the improvement: Kannon Shanmugam.

Kannon, who at last note was on his way to Washington, D.C. to meet with George and Barbara Bush for a ceremony in the Rose Garden, earned a place in the paper by being one of 20 students in the entire United States to be selected for the 1989 All-USA Academic Team. Check out his bio from *USA Today*. Indeed, Kannon is quite a guy. But what *USA Today* failed to mention is that he's also great to work with and a pleasure to know.

Congrats, guy! Now get back to work.

"I am a Secretary for a DX club," says Taimur Rahman of Dhaka, Bangladesh. Our club had been damaged during the last year catalysis and our library of books were totally damaged so now we need some publications to restore our library. Would your readers mind sending us some publications?" I don't know, Taimur.

Mr. Rahman's address is International Radio Listener's Club, Konobary, P.O. NIIL Nagar-1346, Dhaka, Bangladesh. I might point out that the International Radio Listeners Club is, according to its letterhead, a pretty busy group.

It is "a non-profit organization for radio and IV [sic] DXers, Velio [sic] Film Makers, Scientific Researchers, Volunteers" that publishes the *IS IRLCDX News*, holds monthly meetings and sponsors a yearly convention and exhibition." Can curing the common cold be far behind?!

Back to Arnold Hartley for one last comment: "Your 'Nudist Radio' photo on page 100 of the May 89 issue belongs to WSRN of Swarthmore, PA, the Swarthmore College FM, rather than "WSRL." Let's be charitable and call it a schoolboy prank.

"The photograph looks as if someone

tried to doctor the "N", hence the confusion."

Now there's a lead that deserves further investigation. Bob, do you mind if I head on up to Swarthmore college to check this out? Bob? Bob?

Monitoring Times is proud to announce that it placed number one in the 1989 RCMA members' survey. According to the club's official analysis, more members read *MT* than any other publication.

Letters should be addressed to **Letters to the Editor**, *Monitoring Times*, P.O. Box 98, Brasstown, NC 28902 and should include the sender's address and telephone number. Not all letters can be used. Those that are will often be edited and excerpted. Because of the volume of mail received, personal replies are not always possible.

CONVENTION CALENDAR

Date	Location	Club/Contact Person	Aug 5-6	Jacksonville, FL	Jacksonville Hamfest Assn/ Billy Williams N4UF P.O. Box 9673, Jacksonville, FL 32208
Jul 2	Wilkes-Barre, PA	Murgas ARC/ Robert Nygren WA3YON RD 1 Box 134-6, Sweet Valley, PA 18656	Aug 5-6	Cedar Rapids, IA	Talk-In W4IZ 146.76 rpr
Jul 8	Oak Creek, WI	S. Milwaukee ARC/ Robert Kastelic WB9TIK PO Box 102, S. Milwaukee, WI 53172-0102 Talk-In 146.58 WA9TXE/9	Aug 6	Randolph, OH	Cedar Rapids ARC/ Clifford Goldsberry 2926 Schaeffer Dr SW, Cedar Rapids, IA 52404
Jul 8	Des Moines, IA	Des Moines RAA/ Jim Zeilmer KAOVSL 6390 NW 54 Ct., Johnston, IA 50131	Aug 6	Berryville, VA	Portage ARC/ Joanne Solak KJ3O 9971 Diagonal Rd, Mantua, OH 44255
Jul 8-9	Atlanta, GA	Atlanta RC/ Cooper Morris WA4PZD 2272 Armand Rd, Atlanta, GA 30324-4249	Aug 11-13	Milwaukee, WI	Shenandoah ARC/ John Kandoe N4MM RFD 1 Box 73A, Boyce, VA 22620
Jul 8-9	Indpls, IN	Central Div Conv/ Cornelius Head WB9ZQE 9046 Mercury Dr, Indianapolis IN 46229	Aug 12	Springfield, MO	10-10 Intl Net/ Joseph F. Williams WA9TSG PO Box 93181, Milwaukee, WI
Jul 9	Pittsburgh, PA	North Hills ARC/ Robert Ferrey Jr N3DOK 9821 Presidential Dr, Allison Park, PA 15101	Aug 13	Lexington, KY	SW Missouri ARC/ Linda Baxter KA0NXI 2616 W Woodlawn, Springfield, MO 65803
Jul 9	Alexander, NY	Genesee RAI/ Don Partis 8786 Broadlawn Ave, Baravia, NY 14020	Aug 19-20	Huntsville, AL	Bluegrass ARS Ctr KY/ Bill DeVore N4DT 112 Brigadoon Pkwy, Lexington, KY 40503
Jul 9	Downers Grove, IL	Dupage ARC/ Edwin Weinstein WD9AYR 7511 Walnut, Woodbridge, IL 60517	Aug 19-20	Tacoma, WA	SE Div Conv/ Jim Brashear WB4EKJ 3002 Boswell Dr, Huntsville, AL 35811
Jul 14-15	Essex, MT	Glacier-Waterton Int'l/ Bob Delp W7ETP 1105 24 Avenue West, Havre, MT 59501	Aug 19-20	High Point, NC	NW Div Conv/ Jerry Seligman W7BUN 12306 80th Ave E, Puyallup, WA 98373
Jul 14-16	St.Petersburg Beach, FL	ANARC-89 (Dolphin Beach Resort) P.O. Box 272301, Tampa, FL 272301	Aug 20	Dover, DE	High Point ARC/ Mark McMahan KB4MFP 122 Avondale Dr, High Point, NC 27260
Jul 15	Union, ME	MidCoast RC/ John Peterson N1CBA P.O. Box 601, Augusta, ME 04330	Aug 25-27	Los Angeles, CA	Kent Co ARC/ Carl Shulak NS3G 32 Loockerman SQ, Suite 302, Dover, DE 19901
Jul 16	Washington, MO	Zero-Beaters ARC/ Al Lanwermeyer WB0BS 909 Nora St, Washington, MO 63090	Aug 25-27	Madison, GA	SW Div Conv/ Sandi Heyn WA6WZN 962 Cheyenne, Costa Mesa, CA 92626
Jul 16	Charles, IL	Fox River ARC/ John Hanses WB90 334 Sharon Lane, N. Aurora, IL 60542	Aug 26-27	Saginaw, MI	Confederate Signal Corps/ Roy Jordan WB4ILR 1146 Shoreham Dr, College Park, GA 30349
Jul 16	Van Wert, OH	Van Wert ARC/ Jack Snyder WD8MLV Rt 2 Box 153C, Ohio City, OH 45874	Aug 27	Marysville, OH	MI State Conv/ Bob Granstra WB8DLO 413 Wilson Dr, Midland, MI 48640
Jul 22	Montreal, CAN	CIDX SW Festival/ Sheldon Harvey 79 Kipps St, Greenfield Park, Quebec J4V 3B1	Aug 27	St. Charles, MO	Union CO ARC/ Gene Kirby W8BJN Marysville, OH 43040
Jul 23	Garden Prairie, IL	Big Thunder ARC/ Jim Grimsby W9HRE 210 Oak Lawn Lane, Poplar Grove, IL 61065	Aug 27	Danville, IL	St. Charles ARC/ Eric Koch NF0Q 2805 Westminster, St. Charles, MO 63301
Jul 28-30	Oklahoma City, OK	West Gulf Div Conv/ John Thomason WB5SYT 2 East 11th Suite 19, Edmond, OK 73034			Vermillion ARC/ Chris Stonecipher KA9VMN RR 3 Box 117, Danville, IL 61832
Jul 29	Texas City, TX	Tidelands ARS/ Bill Steele WA5WVP PO Box 892, Texas City, TX 77592			<i>Monitoring Times</i> is happy to run announcements of radio events open to our readers. Send your announcement at least 60 days before the event to: <i>Monitoring Times</i> Convention Calendar, P.O. Box 98, Brasstown, NC 28902.
Jul 30	Peotone, IL	Hamfester RCI/ Robert Truhler W9LNQ 1701 W 101st St., Chicago, IL 60643 Talk-In CFMC Rptr WA9ORC 146.16-146.76			

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The post below, belonging to deputy sheriff Charles Bloss, Jr., of Lecompton, Kansas, boasts a Uniden Madison SSB CB, two Bearcat weather receivers, Regency MX4200, Cobra SR 925, Motorola Mostar VH

transceiver, Bearcat 950XLT, Regency M400, Kenwood R2000, and IBM PC, plus antennas too numerous to mention!



Closing Comments

Uniden Seeks Domination of the Scanner Market

The Uniden Corporation of America, which already controls an estimated 80% of the scanner market, has formally charged AOR Limited of Japan (manufacturer of several scanners including the AR800, 880, 900, 2002, 2515 and prospective 3000) and their American importer, Ace Communications of Indianapolis, with patent infringement.

Prior to Uniden's acquisition of Regency last year, AOR private-labeled a number of scanners for Regency including the MX5000, 5500, 7000 and even earlier models like the HX2000, 2200, MX4000 and 4200.

The suit comes right on the heels of yet another Japanese suit which forced ICOM to remove pass-band tuning on their popular R71A receiver and discontinue their 761 transceiver.

Referring to the Uniden suit, Paul Davis, Executive Vice President of Uniden, stated, "Regrettably, Uniden was forced to file this lawsuit to protect its right. AOR and Ace have been non-responsive to our attempts to resolve this matter on an amicable basis, despite our offer to license the technology."

David Kline, legal representative of Uniden, indicated that attempts to resolve the apparent infringement have been ongoing since March 1989. His company will seek relief in the courts for damages from previous product sales and has issued a cease and desist order against AOR from further manufacture and distribution of scanning receivers. Kline went on to say that his company is looking into possible patent violations in other manufacturers' receivers as well.

The scanning feature is utilized now in the majority of consumer communications receivers in all frequency ranges, including those made by AOR, GRE (Radio Shack), ICOM, Yaesu, Kenwood, Standard, JRC, Panasonic, Sony and others. Uniden maintains that basic patent rights to scanning methods were passed on to them with the acquisition of Regency.

Response from the Industry

A spokesman for one of the corporations named above asserted that Uniden definitely does not own all basic scanning patents. He said he had person-

ally conducted a search and uncovered approximately 100 patents dealing with frequency scanning, many of which predate Uniden and its corporate buyouts.

Another leading scanner observer pointed out how foolish it would be for Uniden to draw attention to their monopolistic intent, especially in the present climate of American resentment of the highly-publicized Japanese takeover of American business and technology.

This spokesman went on to say that such an attempt should inspire a group of American investors to mount a "Made in America" campaign, producing their own scanning products in direct competition with the Japanese radios, and unquestionably receiving considerable domestic support.

MT recently queried several Uniden spokesmen concerning private labeling and licensing agreements. While the company does manufacture equipment for other manufacturers (Radio Shack, Cobra), a 5,000-10,000 unit commitment, up-front tooling costs starting at \$50,000, no warranty repair and at least a half-year lead time are typical conditions.

Licensing another manufacturer, or even manufacturing for them, would in all probability be denied if that manufacturer might be competitive in Uniden's marketplace, according to one Uniden spokesman. If licensing were forthcoming, the royalties may be anywhere from 1-15% of the selling price.

Another interesting question is that, since scanning techniques have been in wide commercial use for decades now without any attempt by patent assignees to protect their inventions, would the courts interpret this inaction as patent abandonment, assigning such technology to public domain? This would be a major blow to Uniden who paid multiple millions for Regency's patent rights.

The next few months should prove interesting. As always, MT will be on top of the situation and keep you posted.

-- Bob Grove, WA4PYQ
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